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A REVIEW OF LITERATURE, SCIENCE, AND ART.

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THE READER.

SATURDAY, SEPTEMBER 12, 1863.

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FLORENCE NIGHTINGALE.

UNDER the title of "*Observations on the Sanitary State of the Army*," a thin red octavo volume has just been published by Mr. Stanford of Charing Cross. When we state that the authoress of the volume is Florence Nightingale, it will be seen why, instead of noticing it among our literary reviews, we make it the topic for an article here. The volume, in fact, is not, and does not pretend to be, a literary work. It is something more—it is a great action. Some time ago a Royal Commission was appointed to inquire and report on the Sanitary State of the Army in India. It was presided over successively by the late Lord Herbert and Lord Stanley; but, if we are not mistaken, Miss Nightingale was, non-officially, the life and soul of that Commission. At all events, all the returns sent from the various stations in India, in answer to the questions of the Commissioners, were placed, while yet in manuscript, in the hands of Miss Nightingale, with a request that she would read and examine them by the light of her knowledge of sanitary matters, and her practical experience in the East; and the paper of comments which she addressed to Lord Stanley, as the result of her consideration of these returns, has been recently printed by the Commissioners in the folio volume containing their report and abstracts of the evidence. It is this paper of comments by Miss Nightingale that is now republished separately. It is Miss Nightingale's gift to the nation from the sick-room from which she has not been able to stir for so long, but in the solitude of which she has still laboured in her work of benevolence.

The contents of the volume are very remarkable. They can be nothing less, we should think, than a revelation of surprise to the well-to-do British public. Of the British soldier in India when he is fighting we have all some idea. From the records of a thousand battles, from the records of the Great Mutiny, we have, all of us, vivid enough pictures in this department. We can well enough fancy them moving and tramping in the Indian fields—those "unnamed demigods." But of the British soldier in India when he is *not* fighting our ideas are hardly so distinct. It is the purpose of Miss Nightingale's paper to give us some information on this subject. It is a condensation of the reports sent home from the British stations in India by the Commanding, Engineering, and Medical Officers, in answer to the questions of the Commissioners. It is a paper of attested facts, interspersed with remarks. "If there be," says Miss Nightingale, "a single station in India with a good system of drainage, water-supply, and cleansing for itself and its bazaars, with properly constructed barracks and hospitals, provided with what is necessary for occupation and health—a station where the men are not encouraged to drink, and where they are provided with rational means for employing their time—to such a station these remarks do not apply. But I have not found it." *There* is the sum and substance of her present paper. There is not a single station for our troops in India which is up to the proper standard of sanitary arrangements and arrangements for the general well-being of the men, or even up to the standard now attained in this country. That, however, puts the case in the mildest light. How far *short* of the proper or the attainable standard the majority of the stations, if not actually all of them, fall, can only be judged by reading through the repulsive and frequently disgusting details which, with the most perfect patience of courage, Miss Nightingale accumulates. She classifies these details under such heads as *Bad Water, Bad Drainage, Filthy Bazaars, Want of Ventilation, Surface-overcrowding in Barracks, Encouragements to Intemperance, Unsuitable Diet, Want of the Means of Occupation and Exercise, Defective Hospital Arrangements, Mismanagement of the Hill-Stations, Discomforts of the Wives of Married Soldiers.* Under each head she quotes passage after passage from the evidence, referring to this station, to that station, and to another station—the passages following each other like a succession of bullets continued on each spot till the effect is made. Sometimes a few words of Miss Nightingale's own interrupt these quotations, generally in a tone of sarcasm, irony, or suppressed indignation. To illustrate the state of things at most of the stations she has also introduced a number of woodcuts—some of them plans of buildings, &c., which it requires something of a professional eye to understand; but a few of them graphic representations which appeal to the sense of humour. Thus, to illustrate the mode of water-supply at most of the stations, we have two cuts, entitled respectively "Beginning of Water-Pipe" and "End of Water-Pipe"—the beginning of the water-pipe being nothing else than a sturdy native who has just filled a leather-skin with water somewhere or other, and is trudging off with the skin slung round his back; and the end of the water-pipe being the same native arrived at his destination and squirting the far-carried liquid into a jar. Then, by way of bringing before the reader the means which the British soldier at Indian stations has of passing away his time when not on parade or at drill, we have a woodcut of the interior of a barrack-room with the men lounging in it—a good many of them asleep or yawning at full stretch in their beds, two or three sitting up in their shirts doing nothing, two sitting on their beds playing at cards, one exceptional chap reading what seems an old number of the *Saturday Review*, one combing his hair, and one, who seems the most sensible and active of the lot, standing with his bare feet on the cool floor, smoking a short pipe, and meditating like a griffin. In short, the result is an impression that the British soldier in India, when he is not fighting, is about as ill-cared for as possible—that he has not even water to wash with.

Many of Miss Nightingale's arguments and representations in the present pamphlet will have to make their way, we believe, through a resisting medium. In some quarters, we know, it has begun to be the notion of late that the sanitary movement has perhaps been overdone—has been carried to exaggeration. It has begun to be a query whether after all we are so assured scientifically of the effects of complex agencies upon health as the Sanitary Reformers have been accustomed to assume. Then, again, it may be asked whether, with all these indictments against our system of managing our soldiers, it is not the fact that the British soldier, even when he comes from India, is a cleaner-looking, more upright, more healthy, and altogether better-bred animal than any non-military being from the corresponding ranks of society that can be set against him. Is not Miss Nightingale's demand, it may be said, a demand for raising the condition of the army, in respect of physical and moral treatment, above a level which is already relatively high? Is not her woodcut of the Indian barrack-room only a representation of what might have been found a little while ago, and may still be found, in any barrack-room at home—where, from the very nature of the case, the majority of the men, out of drill hours, will lounge about unbraced, or loll at length asleep, or amuse themselves with cards, or brush their hair by a hand-glass, or smoke short pipes, and where it will be only the exceptional and unsocial chap that will betake himself to mental improvement and the *Saturday Review?* We are not sure but that some form of these objections, mixed with others, exists at head-quarters, and has already been encountered by Miss Nightingale during the progress of this very Commission on the Sanitary State of the Indian Army. "Our soldiers have roughed it very well in Indian stations hitherto, even with a deficiency of wash-basins and towels, and without conveniences for daily bathing," so we can fancy the defenders of the old school saying—"soldiers will be soldiers all the world over; an improvement here and there may be all very well; but a wholesale topsy-turvying of the present system to suit these new sanitary crotchets will not do at all." Something of this feeling, we believe, does exist at head-quarters, though, against Florence Nightingale, it hardly dares publicly to express itself.

Miss Nightingale is, doubtless, prepared with her answers. The statistics of the mortality in our army from ascertained and preventible causes are at hand. The convictions of scores of medical men, who have made sanitary matters their study, are not to be set aside by any amount of bluff and unreasoning military conservatism. The best commanding officers are advocates of all or most of the proposed changes. That there should be better water-supply, better drainage, better bathing-accommodation at Indian stations; that the diet of the men should be regulated for them by experience of what is fit for the climate; that the sale of spirits to the men in Government canteens should be absolutely discontinued; that the wives of married soldiers should be better accommodated; that there should be fuller means of physical recreation and mental improvement attached to every barrack; and that more use should be made of the hill-stations—these are practical recommendations almost unanimously made. In carrying such changes into effect, Miss Nightingale and the Sanitary Reformers will be backed, if necessary, by a force of public opinion sufficient to overbear official reluctance. And what if the tenor of her recommendations, as a whole, is to raise the level of our entire system of army-management? Are we not tending to this in all that is doing for our army at home, and in all our discussions as to what more may be done? Having an army, having these myriads of men picked out from the community for special service, under a state of control and organization such as no other collection of men in the

empire are bound by, what though the State *should* rise to a higher idea of its duties with respect to such a body than that of getting the best fighting out of them when it is needed? What though it should conceive a pride in improving and elevating these men individually to the utmost, so that they may be patterns of general human efficiency, and so that, when they are returned into the community, their superiority for all purposes may be recognised, and men may say, "There is no school for a man, to make the most of him, like the British Army"? If Miss Nightingdale goes on in this direction, some of our ablest statesmen and social reformers go with her. She quotes, among others, Sir Charles Trevelyan, who has very high ideas as to the extent to which the British soldier, still remaining the splendid fighting animal that he has always been, might be turned to account, by education and the encouragement of talent, in the industrial, and even the administrative system, of our Indian empire.

But this little volume is interesting, not only on account of its subject, but also on account of its authorship. Among British women Miss Nightingale is all but unique; or, if she is not unique, it is because her influence has raised a class striving towards likeness to her. Hers is an example of that kind of greatness which consists in what we have seen somewhere called "a great moral brain"—the characteristic of which is not so much intellectual deftness or comprehensiveness, as strongly-conceived purpose and perseverance in asserting it. We have few such minds among us, men or women—perhaps more among our women than among our men. The habit of *coming forward* on behalf of any idea or purpose is too rare among us—perhaps because there are few that have anything in their minds to come forward for. Whoever has an idea or purpose, and will come forward for it, will, in this age of uncertainties, when the mass even of talent is mobile to any force, exercise a power and produce a movement. But the perfection of "a moral brain" is when its idea or purpose is one which will bear investigation, one which the best thought of the age can approve. Whoso "comes forward" so endowed is a great character. In the most splendid sense of the term, when Miss Nightingale offered herself for the Crimea, *that* was a case of "coming forward." As when Joan of Arc "came forward" in France, one hardly asked *whence*. The manner and the way of it were beautiful and all-convincing. France hailed the glorious rustic maiden as her Heaven-sent deliverer; and *we* hailed as our army's ministering angel the well-born English lady. How we cheered her then! And, since then, in the solitude of her constant sick-room, she has ever been the same. And now again she "comes forward." Let us do what she wants done, and take no denials. How plainly, how directly, she speaks. None of the flummery of mock-philanthrophy in this pamphlet; the benevolence here is not in the nerve, but in the bone. One notices the same character of curtness in speech, of hardness, and even sometimes of seeming harshness in manner, as in the philanthropist Howard. But the *soul* is Love.

CURRENT LITERATURE.

MEXICO AND THE AMERICAN WAR: THE LAST NAPOLEONIC PAMPHLET.

La France, Le Mexique, et Les Etats Confédérés. (Paris: E. Dentu.)

Mexico: The Country, History, and People. (The Religious Tract Society.)

THE pamphlet "*La France, Le Mexique, et Les Etats Confédérés*" is the political bomb-shell of the week. It is at this moment agitating politicians in Paris; and, if, as is stated, it is written under inspiration from authority, and is one of those manifestoes which the French Emperor causes to be put forth when he wants to feel his way, it is calculated to produce a sensation here. In America, unless events shall have taken a turn to make it obsolete before statesmen and newspaper-editors can hear of it, the effect is likely to be an uproar. The internal evidence, we must say, favours the idea that the pamphlet *is* an expression, more or less authorized, of the Emperor's views. If the writer has not been actually closeted with Napoleon III. to receive his instructions, if the proof-sheets have not actually felt the fragrance of the imperial cigar, there has been, at least, a close study of the Emperor's intentions with respect to Mexico as they are to be inferred from his deeds and his published words, and a zealous attempt to develope these intentions in the form which the Emperor would adopt if he could be his own pamphleteer. "What Napoleon III. wills, he wills well, he wills long, he wills even till it is accomplished," is one of the sentences of the pamphlet; and, throughout the whole, there is no appearance of doubt on the part of the writer that he is expounding the exact policy of the Emperor's government—expounding "a Napoleonian idea" which, having been long meditated, is now about to burst into action. The pamphlet is well-written, with all the clearness and the light speculative dash of the French. You read it, from beginning to end, as you would a glass of champagne. We can't write such pamphlets here. We are lumbering pamphleteers as compared with the French.

The pamphlet opens with a defence of the French expedition to Mexico, and a proclamation of the Emperor's perseverance in that enterprise, after the British and the Spanish governments had left him alone in it, and when even French public opinion was against it, as an additional instance of his long-sightedness. Here are the main passages:—

> In France, at all times, distant expeditions have at the outset given rise to bitter criticisms on the part of the men of the opposition, and met with poor sympathies from the men of order. To this cause must certainly be attributed the relative inferiority of our country as a commercial and colonizing power, though it occupies the second—almost the first—place as a maritime power. Infinitely more ready for action than for gain, the Frenchman, in war, thinks oftenest but of military glory, sometimes of political influence, never of the business-side of things. In this respect, we are at once superior and inferior to our allies the English—superior by all the greatness of our generosity and our disinterestedness; inferior by all the profoundness of their calculations, and their commercial genius. Thus, when England and Spain, engaged in the intervention in Mexico on the same grounds as France, retired and left to France the charges and the eventualities of an expedition commenced in common, there was but one voice of lamentation over the situation made for us by our allies of the day before. No one suspected, no one cared to suspect, the fruitful results of our intervention in the affairs of Mexico. People then affected to calculate the sum which each soldier cost that was transported from Cherbourg to Vera-Cruz, and tried to make it appear that the only end aimed at was to impose upon the Mexicans a form of government antagonistic to their tastes and their beliefs. . . Where so many persons strove to see only some little glory to be won, Napoleon III. had already laid down the bases of a wholly new policy. When for all the world the war in Mexico restricted itself to a simple military question, he kept, defined, and fixed the *rôle* of our soldiers, our sailors, and our diplomatists in that enterprise which is to give to France the commercial rank which she ought to hold. "In the present state of the civilization of the world, the prosperity of America is not indifferent to Europe; for it is America that gives aliment to our manufactures and life to our commerce. We have an interest in seeing the United States powerful and prosperous; but we have none in seeing the United States possess themselves of the whole Gulf of Mexico, dominate thence the Antilles as well as South America, and become the sole dispenser of the products of the New World." These words, taken from the instructions given to General Forey, are a victorious reply to those who now ask why we have expended men and money in founding a regular government in Mexico. France must oppose herself to the absorption of South America by North America. She must equally oppose herself to the weakening of the Latin races on the other side of the ocean; and she desires also to ensure the independence and safety of her colonies of the Antilles. The same interest which directs the sympathies of France to the side of the Secessionist States has led her flag as far as the walls of Mexico. The recognition of the Southern States will be the consequence of our intervention; or rather our intervention has pre-prepared, facilitated, and rendered possible the diplomatic act which shall consecrate the definitive separation, the secession from the United States.

Here, it will be seen, two ideas are broached—*first*, that by the hold which France has now taken of an important portion of the New World, Napoleon III. has furnished her with the most splendid opportunity she has yet had of becoming a great commercial nation and reaping all the advantages and exercising all the influence that belong to such a nation; and, *secondly*, that, as a means to this, it is essential that the present American War should end in the disruption of the United States into at least two powers, and that France should hasten this result by the recognition at the proper moment of the independence of the Southern States. These two ideas, accordingly, are illustrated and enforced in detail throughout the rest of the pamphlet.

A glowing picture is sketched of the natural capabilities of Mexico, by its geographical position as the junction of North with South America between the two oceans, by its climate, its fertility, its beautiful scenery, and its exhaustless mineral wealth. Why so little has yet been made of such a splendid piece of the New World is then rapidly accounted for—too rapidly for any one who likes to go under the surface in history—and the writer hurries on to his conclusion. That is, that Mexico is to be lifted out of the slush and mire of its present condition under a medley of degenerate Spaniards and lawless and indolent half-breeds by the agency of a new and well-ordered emigration from Europe—an emigration fortunately of the same Latin race that have made a mess of it hitherto, but of a division of that race that will not make a mess of it, but will even put life into the old dregs. It was an emigration from England that gave industry, riches, and courage to the United States of America—the same emigration withdrawing elements of disquiet from England; and an emigration from France will do the same, with the proper Latin difference, for Mexico—acting as a similar outlet at the same time for the hot blood of France. Here is a notable passage:—

> Whoever has lived long in Great Britain returns thence struck with the flagrant, perpetual contradiction between the individual genius of the English, strongly bent on commercial, maritime, and industrial adventures, and the political genius of the English nation, which repels *à priori* all revolutionary ideas. It is needless to seek a principle of reason in the perfection of English institutions; for, in admitting even the superiority of her representative government, one is forced to avow that her manners and her social laws are capable of great improvement, especially those which regulate property. In France, on the contrary, we have at all times loved political adventures. Days without a to-morrow had powerful attractions for our fathers, and the present generation has, in 1848, largely sacrificed to this taste; but we let ourselves be seduced with difficulty by private enterprises. What pleases us in politics often displeases us in business, and our individual temperament has not always been up to the height of our national temperament. Nevertheless, these few years, we have been gaining in industrial boldness; the calm and the solidity of the institutions which France has recently received tend to drive beyond her bounds undisciplined dreamers and hot-heads, the very emigrants and colonists of whom we speak. Let but a certitude of protection lead them to Mexico, and the era of that country's regeneration will not be far off, provided as it will then be with a new population, apt for all progress, initiated in the discoveries of modern industry, and supported by the intelligent liberalism of the French flag. It is beginning to be seen that the national interest, rather than the desire to add a name to the already long list of our military victories, has led France to Mexico. Let people, therefore, be tranquillized as to the future of the expedition. Let the Archduke Maximilian mount the throne of Mexico, or let him

refuse it; let another prince accept in his place, or let an anonymous government establish itself in Mexico under the shadow of our eagles; equally the French influence will remain there.

But the most stirring portion of the pamphlet is that which developes the relations of the French occupation of Mexico to the great American war. On this head the writer thus expresses himself:—

The secession of the Confederate States becomes an event particularly favourable to France; for England has no longer any interest in the cessation of hostilities, and the consequent establishment of a balancing power intermediate between the Federals and the Hispano-American continent. She fears for Canada, in which the North might seek, after the war, a compensation for her losses. Her maritime commerce profits by the present disturbance of the American commerce; she sees with satisfaction the North and the South weaken each other; she furnishes arms to both parties; and, while the South no longer supplies cotton, she developes its culture in the Indies. England, therefore, will never take the initiative in the recognition of the Confederate States; and the two rejections she has given to our proposals of pacific intervention remove all illusion on this subject. France, on the contrary, cannot count on drawing the cotton necessary for her manufactures from any other quarter than the South. All the experiments in plantation that have been tried have remained fruitless, and, unfortunately, it is probable that all that may be tried will have the same fate.

Naturally, there will be some curiosity as to how the Napoleonic mind comports itself towards the question of slavery, as mixed up with the American war, and how it contrives to reconcile the proposed policy of recognising the Southern States with the well-known zeal of France, and especially of Napoleonic France, for the cause of liberty and equality all over the world. The Emperor, if the present pamphlet represents him, is of the same opinion on the slavery branch of the subject as the majority of Englishmen at present—that is to say, he does not believe that Abolitionism, or any form of real care for the negro, is the motive of the war on the part of the North. Let his exponent speak for him:—

The war which they (the Federals) carry on is for them, before all, a war of interest. The South, a producing and agricultural country, was commercially used up by the North, which desires by main force to keep its best client; the emancipation of the slaves is but a pretext ably put in the forefront to win the sympathies of the liberals of Europe. The men of the north, if victorious, would not cut short the question of slavery; become the arbiters of the fate of the slaves, they would hesitate to compromise the culture of cotton, in view of which they maintain with such carnage an unjust war; they would then admit without difficulty that the vital economic conditions of a vast country are not changed with a battle or the stroke of a pen. . . But the first European power which shall recognise the Confederate States will be in the right position to obtain in favour of the blacks much more than would the Federal States maintaining union by victory. This first power being France, one might be sure that the cause of civilization, of humanity, and of progress would not be forgotten. That which would have been difficult, impossible, during the struggle, will become easy in the calm. The emancipation of the blacks, the complete abolition of slavery, can be the work only of peace and time; and from our alliance with the South would come that grand social renovation which England has vainly pursued with her right of search. For the rest, Slavery should not, in any case, be a serious argument against the recognition of the South. France and England live in good understanding with Spain and Brazil; they protect Egypt and Turkey; and these countries maintain slavery, and show no disposition to abolish it. France will use her influence to arrive at the gradual emancipation of the slaves, without at all making it a case of non-recognition.

The recognition of the independence of the Southern States by France—this, it will be seen, is the immediate practical drift of the pamphlet. That the recognition should not be delayed is the opinion with which the whole is wound up. Such questions as those of the East and of Rome, says the writer, *may* be postponed. "The interests roused by these questions are either religious or political; they are not commercial; they admit of being discussed. Now, in politics, whatever admits of being discussed needs not be cut short. Time does everything for the appeasing of religious and political excitements." The American question, the writer asserts, belongs to a different category. It *must* be cut short, and the sooner the better. Let France deal the stroke. Let her recognise the South, and so proclaim it as an exigency of the Old World that the vast republic of North America be broken up; and other European states will follow. Spain will follow first; then Austria, whose interest in the affairs of the New World will be more direct if she accepts the Mexican throne for Maximilian; and, lastly, Great Britain will give in her adhesion. The Northern States will then, if not before, see the folly of persevering in a useless struggle. "The navy of France is an argument which will support her diplomatic acts" are the significant words with which the pamphlet closes.

Having thus given the substance of what we believe to be the last Napoleonic essay on the affairs of the world, we have no space left to criticise it. To us, we may say, the most obvious criticism of the whole disquisition—both what of it is historical and what is prophetical—is that it is too swift, too sanguine, too nimble, too "cocksure." This is a very common character in French pamphlets. Providence was not born in Paris, and the History of the World is much more lumbering and heavy-built than any French theory of it. Yet the pamphlet is important—not only as perhaps a premonition of French action in the American question, but also as an elucidation of the fact that the era of the Monroe doctrine is at an end, and that the Old World and the New can no longer be mutually exclusive, but will each henceforth, despite the Atlantic, have its fingers in the other's pies. This also is a Napoleonian idea.

At the head of this article we have associated with the French pamphlet a little work on Mexico published by the Religious Tract Society. It is as if we put a pious English parson into a cab with a Zouave. The book, which consists of 340 pages, is a succinct compilation of all sorts of information about Mexico down to the period of its occupation by the French. The compilation seems carefully done, and is likely to be useful. Much of the spirit of the work is indicated by these sentences in the preface:—"Nor can the Christian think of those vast regions, now 'sitting in darkness and the shadow of death,' without a sad and mournful interest. We claim them as forming part of the domains of the world's true King, and long for the time when Satan, who now reigns there with a scarcely questioned supremacy, shall be dethroned and cast out. Nor shall our hopes be vain. The mighty fabrics of imposture and superstition, which so long have dominated over that unhappy land, shall be demolished, and the kingdom of righteousness and peace shall be established on their ruins." We should hardly suppose that the Religious Tract Society anticipate that the direct agency to these results will be the French occupation of Mexico and the new emigration of the Latin race to which that occupation is to lead. But speculation about Mexico is likely to make one acquainted with strange companions; and, where there is but one conveyance, the most orthodox parson must share it even with a Zouave.

WATERING-PLACES — MARGATE OF OLD, AND OSTEND OF TO-DAY.

Murray's Handbook for Belgium. (Murray.)

Petit Guide des Etrangers à Ostende. (Ostende: Godlfurneau.)

Ostende: Confortable, Pittoresque et Hygiénique. (Wahlen: Fierlat's Libraire de la Cour de S.A.R. Mgr. le Comte de Flandres; Ostende.)

FORMERLY it was a work of difficulty, and, indeed, of some danger, to get to Ostend. In my early youth the Ostend packet started from Margate, to which Cockney watering-place you proceeded either by hoy, with the riff-raff of London, laying in their own provisions, which the said raff carried in cotton pocket-handkerchiefs, or by a small-power Margate steamer, which took generally from eight to nine hours to perform the journey. There was also a third way of proceeding, which was neither pleasant nor comfortable. You took the Dover stage to Canterbury, and from that city were carried in what was then called a long coach to Margate. The Dover coach proceeded to Canterbury at the rate of from seven to eight miles an hour; but the Margate stage was almost as slow as the heavy Falmouth van, to which Canning pleasantly made allusion in answering a speech of the late Lord Nugent, on the French invasion of Spain, in 1823. In my boyish days it cost you more than half as much in tips to coachmen and guards to get to Margate as it would cost you now to travel thither in about two hours by an express train. A gentleman in those expensive days never gave less than half-a-crown to a tip-top whip, and generally as much to the guard, who had charge of the luggage, and took care also of those who were fond of "cakes and ale."

Arrived at Margate at dinner-time, you spent the night at Wright's York Hotel, and early on the following morning embarked for Ostend. The fare at Wright's was in those days capital, and, for aught I know, may be so still. His turtle soup, though not comparable to that of the old Bush at Bristol (now extinct), or the Waterloo at Liverpool, was still very good indeed, and not dearer than elsewhere. His haunches of venison, procured from the neighbouring park of Mr. Powell, of Quex, were first-rate; and there was a cook in the house who could serve up a hash of the same haunch capable of "creating a soul under the ribs of death." The dessert used to be worthy of the dinner. In this instant month of September, the Spanish *Bon Chrétien* pears were superlatively sweet and succulent; and the Kent filberts, as most of us know, like the Kent cherries, are not to be matched on the continent. For fish the market of Margate has been long celebrated. Nuttier haddocks or firmer are not taken in Dublin Bay, or any part of the Scottish coast, and there are no such chicken turbots and brills found on the Irish or Scottish coast as the Margate hovellers catch off the Dutch coast and Dogger Bank. So that, if you suffered in the olden time from your journey to the Cockney watering-place, you at least found compensation and comfort on reaching your destination.

On the morning after your arrival at Margate, between seven and eight of the clock, you embarked for Ostend, paying £1. 10s. for your passage; and you seldom arrived at your destination (though Cardinal Wolsey crossed in six hours) ere the shades of evening or night had set in.

For two centuries before I first set my foot on the pier of Margate—namely, from 1620—the town maintained a considerable intercourse with Belgium, Germany, and France. In James I.'s time, the Elector-Palatine landed there; and William III. and the Georges I. and II. also landed and took their departure from Margate in journeying to the Continent. Marlborough, after his victories, also set foot in the town in 1763, and so did Duncan, in 1797, after the victory of Camperdown. In 1815, the wounded from Waterloo were landed at Margate; and I myself remember that, when the Duke of Wellington yearly proceeded to visit the fortresses of the Netherlands, he generally embarked at Margate for Ostend. Now all this is changed. The packet-station is removed from Margate to Dover, and, in leaving London Bridge or the Victoria Station, you arrive at your destination at nine o'clock, and step aboard the Belgian steamer in an hour and a-half after you have left the smoke of the metropolis. Formerly eleven, and in winter twelve and thirteen, hours were consumed in this journey; and the run across the Channel seldom took less than twelve or thirteen, and, in boisterous weather, sixteen and eighteen

hours; now it seldom occupies more than six hours, and is often done in five, and sometimes in less than five. The sea-journey, though bracing, is an uninteresting passage. The coasts are low, flat, and sandy, and nothing can be more unpicturesque.

You do not see Ostend till you come within a couple of sea-leagues of it, and then the first object that strikes your eye is the light-house, which is thirty-two metres in height. At the present moment, the 11th September—which is the commencement of the fishing-season—there are close upon three hundred smacks—Belgian and French—preparing to leave for the cod-fishing off the coasts of Scotland and Ireland; and to these people, comprising about fifteen hundred sailors, this fine lighthouse, which can be seen from a long distance, is a real benefit. It is placed very near the Porte de Secours.

Ostend counts about 18,000 inhabitants; but, in a full season like the present, from 10,000 to 12,000 strangers must be added: so that the place probably contains at this moment from 28,000 to 30,000 souls. It is twelve miles west of the picturesque town of Bruges, and sixty-seven miles distant by rail from Brussels. Railroads have now placed it in communication with France, Germany, Switzerland, and Italy, and it is at present on one of the great high-roads of Europe. A few minutes after the arrival of the steamer, the traveller, if English, may land without a passport—the examination at the custom-house is a mere formality—and, almost immediately after receiving his luggage, he may proceed for Brussels, Aix-la-Chapelle, or Cologne, or whithersoever business or pleasure may lead him. A few years ago how different was the system! The Belgian police were then fussy, and somewhat arrogant and exacting in the matter of passports, and the examination of luggage was also rather rigorous. As the present moment is the height of the season at Ostend, the traveller would do well to spend a week or a fortnight in the little town. A few years ago there were but three decent hotels in the place; now there are at least twenty, of which the principal are the Hôtel des Bains, Rue du Quai; the Hôtel Fontaine, Rue Longue; the Hôtel de Prusse, and the Cour de Russie, Rue de la Chapelle. There is also the Railway Hotel, almost abutting on the station, where I have heard travellers are comfortable enough. It is much frequented by Germans and Belgians.

The Hôtel des Bains and the Hôtel Fontaine, however, seem to attract the greatest number of visitors; and here the *tables d'hôte* have been crowded for the last fortnight, and will be so till the end of the month. Sometimes the number of diners is very great and cannot be accommodated, while on other days business is more slack. The charge for dinner is three francs, ten sous, at both houses. The price of a bedroom varies of course with the position and size of the room; but from two francs, ten sous, to three francs, may be considered the average. A plain breakfast of tea or coffee, without meat or eggs, costs one franc, twenty-five cents. The necessary supplement of two mutton chops adds another franc, and two eggs increase the bill by another ten sous. Wines are rather dear at Ostend. The best champagne is nine francs the bottle, and a pint of Moets costs five francs. A tolerable Médoc is charged at four francs the bottle.

There are eight or ten *restaurateurs* in the town, where you may dine at the *carte* if you do not like the *tables d'hôte*. The best of these are Delmée, Pavillon Royal, Digue de Mer, and Lantoine. You get good oysters and shell-fish at Lantoine's two establishments—one the Rocher de Cancale, in the Rue des Capucins, and the other at the Phare, near the Porte de Secours. There is also the Grand Parc aux Huîtres, Digue de Mer, where these interesting mollusks are eaten in perfection.

This Digue de Mer is one of the finest sea-walks—perhaps the finest sea-walk—in Europe. It is three quarters of a mile in length, thirty feet in breadth, and sixty feet above the highest tide. From this dyke, or sea-wall, you have a wide expanse of sea-view, and also a view of the incoming and departing steamers, mercantile craft, and fishing-boats. It is the great rendezvous of all the visitors, from nine in the morning till ten or half-past ten at night. There are among them a considerable sprinkling of Germans, a fair number of Russians, a good many Parisians and French of the northern departments, and a more considerable number of English. At the Pavillon Royal and the Pavillon des Dunes breakfasts are preparing and serving from nine o'clock till twelve. That pale-faced Hollander, with his wife and child, are feasting on a dish of soused herrings, while the party of Parisians at the opposite table are busily engaged in discussing *biftek aux pommes*, *saumon à la Tartare*, and an omelette *aux fines herbes*. The hard-featured, stout-looking man from Liège, sitting *al fresco* to the left, with the bottle of Belgian beer before him, has already consumed three dozen of Ostend oysters, and after these has ordered *pieds de porc à la Sainte Menehould*. The two silent Englishmen, with the tea-pot before them, seem satisfied with their fried bacon and eggs *à la coque*, while the heavy-looking pair of Germans to the right are indulging themselves in a dish of *saucisses à la choucroute*, and a bottle of *Liebefraumilch*. The Russian in the corner, who has eaten a large dish of *sardines fraîches*, is now assiduously applying himself to a *filet de bœuf au vin de Madère*. The least crapulous and the cleanest-feeding among the lot is that English family, consisting of three ladies and two gentlemen. Observe how clear and clean they look, and how perfect their attire. Their *menu* consists of tea and coffee, of dried toast, of some slices of cold ham, and a plate of eggs. They do not vociferate or gesticulate. They do not speak with full mouths, eat with their knives, or pick their teeth with their forks. They do not spit on the floor or into their pocket-handkerchiefs, nor do they tuck their napkins under their chin. I might go on *ad infinitum* describing breakfasts, each differing in kind and quality; but *cui bono?* Each country has its customs and its dishes. The Italian breakfasts on a plate of fresh figs or rice-milk, while the Spaniard has his rusk and chocolate saturated with cinnamon and thick as a custard.

Towards twelve o'clock at Ostend breakfasts grow slacker and still more slack. At that hour bottled beer, dominoes, chess-boards, *demi-tasses*, and *petits vers* are in great request, as well as the French, Belgian, and English newspapers. Cigars and pipes are also smoked in great quantities in the open air, in the smoking-rooms, and on the beach. Let us descend to the beach from the steps nearest the Kursaal, and witness the manner of bathing in this Belgian watering-place.

From the hotels in the town a great number of women, children, and men are carried to the shore in carriages, or *char-à-bancs*, while others, more wisely, stroll leisurely on foot. At the Pavillon des Dunes there is a kind of ambulatory bureau, in which sits a woman, who, on your paying seventy-five centimes, furnishes you with a ticket. Another damsel hands you a pair of blue drawers, with a running string across the back, rather the worse for wear, and a couple of small towels, ill-washed, and of a *café-au-lait* colour. Provided with these appendages, you wait your turn of a machine, which may be occasionally delayed a full half-hour, more especially in the height of the season. At length, after *hurlant et criant à tue-tête*, the machine arrives, and you enter it. It is large, lumbering, unwieldy, and ricketty. It presents on every side numerous orifices and "*trous Judas*," so that you have the advantage of an air-bath, as well as a sea-bath, in journeying to the latter. You have the advantage, too, of having the soles of your feet delicately titillated by layers of wet sand, which have been deposited on the floor by your numerous predecessors. At length, after five minutes of uncomfortable jolting and swaying to and fro, you arrive at the enormous depth of three feet of water, the machine turns round, the horse is unyoked, and now you are free to bathe as you list. You emerge from your wooden box in a second, and are surprised at the crowds of men, women, and children congregated around you, dabbling and jabbering in the water, laughing, joking, shivering, and playing all sorts of antics. Husband and wife, lover and mistress, affianced and *fiancée*, here join hands and duck, dabble, and dash water at each other with frolicsome gaiety. Sometimes a circle of twenty or five and twenty join hands, dancing and singing in chorus. To relate a tithe of the pranks, capers, *gambades*, and merry tricks cut and played on Ostend *plage*, would greatly exceed the space allotted to me. Suffice it to say, that some of these bathers, male and female, remain from half-an-hour to an hour in the sea, thus injuring instead of recruiting their health. They remedy the exhaustion produced by long immersion by now and again resorting to cordials and a glass of wine or beer. Some of the heavy Germans eat a slice of sausage, and take a glass of absinthe or *Kirschwasser*. The noisiest and most boisterous bathers of all are the French. They are essentially *tapageurs*, and vain as peacocks. Even when dressed in bathing costume, one main idea runs in the head of a Gaul, which may be thus expressed:—

> Je suis assez adroit; j'ai bon air, bonne mine,
> Les dents belles surtout, et la taille fort fine;
> Quant à se mettre bien, je crois sans me flatter
> Qu'on serait mal venu de me le disputer.

The English, on the contrary, are the least noisy, and the quickest in and out of the water. They use, and do not abuse bathing. Though the younger men amongst us—and more especially Eton men—are exellent swimmers, still, in regard to ease and gracefulness, I must award the palm to the French. Swimming is a regular part of the Frenchman's education. In every large town in France, whether seaport or inland, there is an École de Natation; and those who are taught in fresh water are generally the better swimmers. Bathing at Ostend continues till dinner-time. I myself have bathed there again and again so late as a quarter to seven p.m., ordering my dinner at half-past seven. After the bath a brisk walk on the Digue should be taken by every one who has care for his health. The greater number of continental folk do not take exercise after the bath, but smoke, eat, drink, and play at billiards. When the hour of dinner comes, which is ordinarily between five and six o'clock, you may see men, women, and children wending their way to the hotels. Full justice is done to the viands, and there is a great deal of gormandizing in the men, and, I am sorry to say, in the women above five-and-forty. After dinner, on which I will not dwell further, many return to the Digue to take coffee and a *petit verre al fresco;* while the others prepare for the Kursaal, where concerts, balls, and *soirées dansantes* are given. Here dancing is carried on so long that the return home to hotels or lodgings is, to use the language of Burns, in

> The wee short hours ayont the twal.

Ostend possesses, according to the statisticians, fifty-seven streets and 1500 houses; yet there is but one bookseller's shop in the whole town. The people of West Flanders are not literary. The only books they read are books of devotion, the "livres d'heures," the history of the Immaculate Conception, or that really excellent book, the "Imitation de Jésus Christ." There is little to be *seen* at Ostend, and the environs are not pretty.

The best and wisest sovereign, and one of the best men in Europe, the King of the Belgians, Leopold the First, is now at Ostend, where he enjoys himself mightily, living in a plain and unostentatious manner. He has lately, thanks to the judicious treatment of Mr. Henry Thompson, an English physician, recovered from a severe and dangerous illness, in the early stages of which Civiale, the famous French surgeon, failed to give him relief. The skill of Mr. Thompson has,

however, accomplished a complete cure; and the king now takes his daily ride, followed by a single groom, in the environs of Ostend. The king is immensely popular with all classes; and, at the Ultramontane Congress, held a few days ago at Mechlin, it was admitted by M. de Montalembert and Cardinal Wiseman that the Romanists of Belgium had no complaint to make against their Protestant sovereign. Molière truly says—

"Les rois éclairés n'ont pas besoin qu'on leur marque ce qu'on souhaite; ils voient comme Dieu ce qu'il vous faut."

V. K.

A LADY'S VISIT TO MANILLA AND JAPAN.

A Lady's Visit to Manilla and Japan. By Anna d'A. (Hurst and Blackett.)

WOMEN ought to write good books of travel. Men are often apt to think that the traveller must do something more than observe and put down his observations. They try to arrange facts in an artificial order, and to supply a commentary on their own text. They are not content to collect the bricks—they must build the pyramid as well. Sometimes, of course, the reader is the gainer by their ambition; but, when he is so, it is because the writer is something more than he claims to be. When he is only a traveller, the more strictly he confines himself to his proper function the better. It is a bad division of labour, in most cases, for the same man to collect facts and draw inferences. Those who stay at home can do the latter, while the former can only be done by those who go abroad; and, unless their qualifications for the double task are something out of the common, they will spend their time to most purpose if they see all they can and leave it to others to decide the meaning of what they have seen. Now, women are generally willing to do this. They realize the personal element in travel; they dont want to make their book an economical treatise, or a Blue-Book.

But these negative merits are not quite all that is wanted. It is not enough to escape generalities; we must be supplied with details. If our conclusions are to be our own, we expect the travellers at least to furnish us with the data on which to base them. It is here that Madame d'A. fails. She warns us not to expect to find in her pages "the results of scientific research, or tedious disquisitions on the ethnology and early history of the country," and she boasts of having "purposely avoided all allusion to political matters." But, though we are quite willing to give her credit for these acts of self-denial, we are forced to add that she is not much more communicative on the points which lie strictly within her reach. We admit that, after the publication of so many volumes of Eastern travel, it may be difficult to avoid some repetitions; but, if absolute novelty be not attainable, we may at least expect to have the results of some careful observations; and, for many a year to come, anyone who will take the trouble to "Boswellize" China or Japan can hardly fail to produce a book that will be worth reading. Madame d'A., we suppose, kept a journal—why did she not publish it as it was? It must have been better reading than the compound of unimportant facts and purposeless quotations which she has given us instead.

From the narrative of her stay at Manilla we learn two things. First, that the authoress dislikes cockroaches, and seems to consider that dislike a peculiarity strictly confined to herself; secondly, that the Roman Catholic Church is much given to elaborate ceremonial—in connexion with which novel statement the writer takes occasion to remark that her own religion reminds her of "the narrow way, which has no gaudy flowers to attract those drawn only by the imagination, and not through the heart." The rest of this portion of the volume is made up of extracts from "Spanish authors," whom we suspect to have confined their literary efforts to the production of guide-books, and stories picked up in conversation. Two of these are worth quoting, not from their own merit, but as an illustration how far afield some people will go to bring home nonsense.

Before leaving the Philippines, the following little incidents were related to me [we only give one of the "little incidents"]. A soldier in Manilla, who was fond of playing practical jokes on his comrades and friends, procured a human skull, and, fixing a light in it, placed it cleverly on a cat, which he set at liberty near the place where a comrade was standing sentry. The latter was so terrified at the supposed apparition that he fell down in a fit, from which he never recovered, but died—[it being usual, apparently, for people to go on living in a fit]—not the only victim, by many, to such inconsiderate amusements.

The other anecdote is less adapted for a spelling-book, as the moral is less obvious; but, on the other hand, the catastrophe is less shocking. It is probably intended to win the reader to the path of virtue rather by example than by terror. It appears that there are great treasures reported to be concealed in the vaults under the Jesuits' church at Macao:—

A churchman, on one occasion, urged, I suppose, by the love of filthy lucre, boldly determined to penetrate into their mysterious recesses, and, raising some stones, prepared to descend; but finding after repeated efforts that, owing to a strong current of air, it was impossible to keep a candle lighted, he abandoned the attempt, and set about repairing the havoc he had made.

We should be doing Madame d'A. injustice, however, if we allowed the reader to suppose that she is capable of nothing more serious than stories such as these. On the contrary, she occasionally intersperses her narrative with moral and sentimental reflections. Thus, after a rather amusing account of Chinese marriage ceremonies, drawn, however, entirely from "information we acquired," she pauses to commiserate the bride—

despatched from the paternal roof, where all her life of limited joy, from childhood's innocent gambles to the pleasures of more sedate years, has been passed—where the gentle mother who lovingly tended her infant years, and guided her childish steps, is left to live out her lonely existence.

This touching outburst has, it may be remarked, the recommendation of being about equally applicable to any marriage in any country. Perhaps, however, the following is even more beautiful:—

One cannot reflect on this subject without shuddering. Infanticide is a crime of the most atrocious and heartless nature. The new-born babe has scarcely felt the caresses of its fond mother, before it is drowned in warm water.

In warm water! We wish to draw especial attention to this climax, and the greatly increased effect which is gained by a proper attention to detail.

Whilst at Macao Madame d'A. appears to have kept up her reading; and this time she probably came across an odd volume of the *Biographie Universelle*, as she gives "us some interesting particulars of the life and writings" of Camoëns, gathered from "a French work which I have lately read." At Canton, also, her habits of research still led her to be always on the look out for information; and, on the occurrence of the Feast of Lanterns, she is ready with an explanation of its origin, quoted from a note to "Lalla Rookh." During her stay in Japan she copies less and moralizes less, and is proportionately less amusing. We shall not, therefore, accompany her in that part of her journey; but, before bidding her farewell, we will give one more extract. It recounts an almost miraculous escape from shipwreck, due entirely to the heroic conduct of the captain of the steamer. On the voyage from Yokohama to Nagasaki the ship was caught by a strong current and nearly carried ashore:—

We must have been inevitably dashed against the rocks but for the astonishing coolness and presence of mind our captain displayed. "Stop her!" "Let go the anchor!" "Lower the mainsail!" were the directions uttered by his clear voice, accompanied by others I now remember no longer.

We hope the authoress has forwarded to the proper authorities the name of the officer who expressed himself in so remarkable, if not unprecedented, a manner in the hour of danger. If she has done so, we cannot doubt that his future career will be one of no ordinary success. A commander who has presence of mind enough to say "Stop her!" when he sees his ship drifting to land, must be a treasure to a maritime nation.

LIFE OF STONEWALL JACKSON.

"Stonewall" Jackson, late General of the Confederate States Army. A Biographical Sketch, and an Outline of his Virginian Campaigns. By the Author of "Life in the South." (Chapman and Hall.)

A GOOD deal is told beforehand respecting the quality of this book in the fact that the author is a lady of strong Southern sympathies, who was a resident in Virginia during the greater portion of the events which the book relates. This tells us that we are to expect considerable warmth in the expression of feeling throughout, and, where battles and campaigns are described, less of the coherent intelligibility that would satisfy a military reader than of the hurried skimming from result to result which answers for people in general. There is a dedication, however, of the volume, which tells the reader more of what he is to expect. Here it is:—"To Sir Henry de Hoghton, Bart., of Hoghton Tower, Co. Lancaster, who, amongst many, has generously testified his appreciation of the rare qualities of the Hero who is faintly portrayed in the following pages; and whose patient investigation of the merits, and courageous avowal of the national claims of a people, striving, amid unexampled obstacles, to achieve a meritorious independence, this unpretending little volume is, by permission, respectfully dedicated, by the Authoress." Now, it will be observed by the careful reader of this dedication that the syntax limps. Not only do you not see at first whether "whose patient investigation of the merits," &c., refers to Stonewall Jackson or to Sir Henry de Hoghton; but, when you have concluded by the light of natural reason that it refers to Sir Henry de Hoghton, you find yourself looking in vain in what follows for any verb to which Sir Henry's "patient investigation of the merits," &c., can be the nominative. Turn the words into their natural order and you see the gap at once. "This unpretending little volume is, by permission, respectfully dedicated by the authoress to Sir Henry de Hoghton, Bart., &c., whose patient investigation of the merits, and courageous avowal of the national claims of a people, striving, amid unexampled obstacles, to achieve a meritorious independence ——" Here you are pulled up; nothing more comes; and what Sir Henry de Hoghton's "patient investigation," &c., did or deserved in the eyes of the authoress, she has forgotten to say. Is the blank ominous? Does it mean that the consequences of British sympathy with the South are not yet capable of being uttered? At all events, it shows that the lady is rather apt to stumble in her grammar. And you find this throughout the book. It is sloppily written—with frequent confusions of syntax, and sometimes such a word as "*stragetic*" for "strategic." Seeing, moreover, that no authorities are given, save sometimes in the shape of extracts from despatches and letters in the English and American newspapers, you are not sure whether what you are reading is true. It *may* be true, and the author evidently believes it; but you cannot be sure. You cannot, at any rate, accept this book as the kind of biography of Stonewall Jackson that there might be and that you would like to see, but only as an enthusiastic account of him by a lady who was in Virginia when that was the theatre of his famous actions, and who, having picked up anecdotes about him, has strung them together, in a narrative of the war, for English reading.

Nevertheless, the lady is a likeable lady, and the book does tell us something here and

there that seems to be true, and a little that seems to be new, about the heroic Stonewall. Here are the plums of the book:—

Stonewall Jackson a Student at West Point.—In the four years of his West Point discipline, we find him a plodding, persevering student, systematically mastering the task of yesterday before he undertakes that of to-day; and slowly, but surely, working his way by hard application to a respectable, if not a leading, position amongst his fellow-students. The present Federal generals, McClellan, Seymour, Grant, Stoneman, Burnside, Foster, and some others, were among his classmates; and a number now in the Confederate army, who, in this savage warfare, are leading their ranks, in defence of home and children, against their former friends and companions. We may presume that our rustic student was not devoid of a certain ambition to shine in the lighter accomplishments of his comrades; one of whom so charmed him with his performances on the flute, that Jackson devoted many leisure minutes, for six whole months, in practising a few bars of a popular melody, which, at the end of that period were abandoned, together with his futile attempts to become a musician. When, at the expiration of the four years, Jackson graduated, he was No. 17 in a class of about sixty students. Probably at the outset every boy surpassed him; but he had now only sixteen who outstripped him; and a joke prevailed among his comrades that, had he ten years to study instead of four, he would have become the head of the whole class.

Stonewall Jackson a Professor at Lexington.—His health became much impaired during the Mexican wars, and, therefore, on an invitation from his native State to accept the appointment of Professor of Chemistry and Natural Science, at the Military College of Lexington, he resigned his commission, and returned home in 1852. Soon after settling in this new sphere of life, he married the daughter of the Rev. George Junkin, a Presbyterian minister, and, in accordance with the rites of his Church, made a public "profession" of religion, was appointed an "elder," and maintained a consistent Christian course to the end of his days. His minister, the Rev. Dr. White of Lexington, found in him a zealous and efficient help in all the offices of the Church and parish. He was a regular teacher in the Sabbath-school, where, in the American States, the youth of all classes of society are in the habit of assembling for religious instruction; indeed, these opportunities are embraced even more by the children of the wealthy than of the poor. Wherever Christian aid and counsel were required, wherever the sick and sorrowing claimed sympathy, or religious instruction was necessary, "Professor" (now) Jackson was at hand. Among the negroes, seldom was such a patient, zealous friend to be found as "Mass' Thomas." Every Sabbath he assembled the little darkies to hear and learn the word of God. Nor was his anxiety for their welfare confined to his own household, for, wherever his influence could be exerted for the spiritual and moral progress of the negro, his voice was heard. Combining in so remarkable a degree the dauntless bravery of the soldier with a humble Christian life, we find him, at Lexington, noted for his "quiet manners and politeness," but not conspicuous for brilliant social qualities, or a prepossessing address and appearance. Nor was he extremely popular among his pupils. Unostentatious in dress, silent and thoughtful, temperate in his habits, and stern in the performance of his duties—perhaps not altogether winning to the class of fiery Southern youths over whom he held dominion.

Stonewall Jackson in London.—On the death of his first wife he visited Europe, and here his high appreciation of the sublime and beautiful found ample scope; and, as a friend has stated, "he seemed never weary of dwelling on the magnificence" of our lofty cathedrals, and other public buildings, which must have impressed him as a wonderful contrast to the modest little wooden churches and Court-house of his native mountains. During his European trip, he displayed the same steady system of laboriously "doing London," and seeing sights, that he had practised in conquering his West Point studies. "Sixteen hours a day," wrote the same informant; one who enjoyed the opportunities of frequent interviews and social converse, during a visit to the Confederate States.

Anecdotes of Stonewall Jackson during the War.—To recount them all is impossible. Perhaps one of each kind, given in the words of the narrators, may not prove tedious. The first relates to the coolness of Jackson. "In one of his late flights, 'Old Stonewall' got into a tight place. He found himself surrounded, with only one way of escape, which was over a bridge raked by a battery of the Federals. The old hero saw, in a moment, his strait. With his cape over his uniform, he rode up to the battery and said, 'Boys, you have this battery in the wrong place; move it to that eminence,' pointing to a hill a short distance up. 'Limber up, and be in a hurry.' The order was obeyed, and, as the artillery was taking the new position, '*Stonewall*' rode safely across the bridge." . . . The opinion of a native Virginian: On the retreat of Banks, one of the Stonewall Brigade, who was in the van, wearied with tramping over the bad roads, said to a comrade, "I'm tired of pulling my legs out of the mud; I wish all the Yankees were at the bottom of the sea." "No, no," said his friend; "if that were the case, 'Old Stonewall' would be within stone's throw, and the first brigade would be in the lead."

Stonewall Jackson's Personal Appearance.—This redoubtable chieftain was no less a subject of interest to his enemies than to his friends. In every Federal account is apparent the intense anxiety his presence and movements created. During the battles a Federal captain, who had been taken prisoner, was reclining under a tree, when General Lee and staff rode by. The captain, struck with the dignified and soldierly appearance of the General, languidly inquired who he was, aad expressed unfeigned admiration at his fine figure on horseback. Soon after General Jackson rode by, and the weary prisoner again proffered his inquiries. "That's glorious Old Stonewall!" exclaimed the guard, cheering lustily as his eye followed the hero. Up sprang the recumbent prisoner, and, gazing curiously until the General was out of sight, lay down again, with an expression of disappointment, muttering, "Well, he ain't much for looks anyhow!" The awkward figure of Jackson upon horseback has been the subject of frequent merriment. He usually rode in a loose, shambling attitude, and was very indifferent about his dress and appearance. On one occasion he approached a squad of soldiers at dusk, his horse floundering along through the mire, and himself reeling in the saddle, like a drunken man; so that one of the soldiers, not recognising him, shouted, as he passed, "I say, old fellow, you look as if you knew where to help yourself to liquor; I wish you would hand me some." . . . On first joining the army of the Shenandoah, the horse General Jackson rode was said to be very characteristic of himself, "a plain beast that went straight ahead and minded its own business," an excellent quadruped, that was shot under him; after which an elegant mare was presented to the General. This was a high-strung, visionary animal, who cut capers, and threw her rider, and was soon discarded for a third, a more controllable creature. But the General never ceased to regret the loss of his first steed.

Stonewall Jackson's Sabbatarianism.—The following letter was written by General Jackson three days before the battle of Fredericksburg, and is quoted as corroborative of the previous assertions:—

To Colonel A. R. Boteler, Member of the Confederate Congress.

. . . I have read with great interest the report of the Congressional Committee, recommending the repeal of the law requiring the mails to be carried on the Sabbath, and hope you will feel it a duty, as well as a pleasure, to urge its repeal. I do not see how a nation that thus arrays itself, by such a law, against God's Holy Day, can expect to escape His wrath. The punishment of national sins must be confined to this world, as there is no nationality beyond the grave. For fifteen years I have refused to mail letters on Sunday, or take them out of the office on that day, except since I came into the field. And so far from having to regret my course, it has been a source of true enjoyment. I have never sustained loss in observing what God enjoins; and I am well satisfied that the law should be repealed at the earliest practicable moment. My rule is to let the Sabbath mail remain unopened until Monday, unless it contains a despatch; but despatches are generally sent by couriers, or telegraph, or some other special method. I do not recollect a single instance of any pressing despatch having reached me since the commencement of the war through the mail. . . .

If you desire the repeal of the law, I trust you will bring all your influence to bear upon its accomplishment. Now is the time, it appears to me, to effect so desirable an object. I understand that not only our president, but also most of our colonels, and a majority of our congressmen, are professing Christians. God has greatly blessed us, and I trust that He will make us "that people whose God is the Lord." Let us look to God for an illustration in our history, that "Righteousness exalteth a nation, but sin is a reproach to any people." . . .

Very truly, your friend,

T. J. Jackson.

A Clergyman's Account of Stonewall Jackson's Religious Habits.—"While in camp I preached five times in the Stonewall Brigade. How the men crowded into their log church, how they listened, how they seemed to hang upon the word, you, of all men, need least to be told, for you have seen so much of them from the beginning of the war. On Sunday night, after preaching, the General, Mr. ——, and myself had a long talk, as we sat drying our boots in front of the open fire. When it was near eleven o'clock, the General asked me to conduct worship; and afterwards, before retiring, he set us the example of kneeling again for secret prayer. He then shared his bed upon the floor with me, and we talked till long after midnight. Though usually taciturn, he led the conversation. How anxious he was for his army! how anxious for himself! How manifest it was that he is a man whose great desire is to be right in all things, and especially to be right before God! In our whole intercourse I could not detect the slightest trace of self-importance, ostentation, or seeking after vainglory. To glorify God possessed all his thoughts. 'I have been thinking a great deal about our chief end lately,' said he; 'and I believe the first answer in our catechism tells us it is to glorify God, and to enjoy him for ever; and I think,' he added, 'we need not trouble ourselves much about the second part, if we only attend well to the first. I find my life in camp a very happy one when I am enabled to keep this aim steadily before me—to live for the glory of God.' I found him very earnest also in his views as to our duties to the negroes. He used to teach a Sunday-school for coloured children in Lexington; and all the pressure of his great duties and cares does not divert his thoughts from the spiritual interests of our servants." . . . . . The same friend confirms the anecdote of his faithful negro servant, who always knew when a battle was going to take place: "'Cause massa pray right smart" (a great deal) "all de night; den I packs de baggage, cos I know he goes on annuver expedishum, and I'se berry sure der'll be de *debble to pay*."

As we have said, one would like to see a really authentic biography of Stonewall Jackson. Especially, if, by any amount of research, particulars are yet recoverable respecting that period of his life which was passed in comparative obscurity before he flashed out as the soldier of the South, one would like to have them. As he was a shy and taciturn man, probably no great amount of his *sayings* or *writings* in that period could be collected. But surely some of his students have preserved notes of his lectures at Lexington College; and these would be something.

THE FRENCH MILITARY SYSTEM.

Annuaire militaire de l'Empire Français pour l'année 1863. Publié sur les Documents communiqués par le Ministre de la Guerre. (Paris et Strasbourg: Veuve Berger Levrault et Fils.)

Etat militaire du Corps de l'Artillerie en France. Publié sur les Documents du Ministre de la Guerre.

IT is difficult to write with accuracy on the military system and organization of France. Not merely a knowledge of the actual state of the army of France is necessary, but, to draw any useful inferences or deductions, one should comprehend the military system as it existed in the days of Louis XIV. and his two Bourbon successors antecedent to the Revolution—as it existed in the Republic and the Empire—as it existed at the Restoration, at the succession of the head of the junior branch, and during his not inglorious reign of eighteen years. It is difficult for an Englishman to divest himself of the prejudices which he has imbibed at home from custom, education, and tone of thought; and yet he must rise superior to these prejudices, or he cannot fairly do justice to a foreign system, differing in most essential particulars from his own.

French military organization comprises within its immense sphere everything that relates to the education, training, recruiting, arming, manœuvering, and advancement of the army.

The system which prevails at this day took its rise in the reign of Louis XIV. A century and a half before the time of the Grand Monarque the French soldier was not what he afterwards became. In the fourteenth century the Spanish *miquelon* was superior to the French *fantassin*, who was the creature of a vicious system. The regiments at

that era were under the government of a proprietary colonel, and the captain clothed and equipped his troop as our colonels do now. Louvois created schools of artillery, cavalry, and infantry, and Choiseul introduced still stricter discipline, as well as further improvements. Obedience, unity, and effectiveness in the field were the results; and the work of reform was continued by the war-ministers, St. Germain and Ségur. The *état major*, or staff, was created under this latter minister; and though this body does not deserve all the encomiums passed on it by some very superficial English writers since the Crimean war, yet it must be admitted much of the success of the French armies and some of the military talent of the officers are the result of staff training, though General Fésensac, in his recently published work, shows that the organization of the French staff is far from perfect.

Much praise has been lavished, both in France and England, on the organizing genius of Carnot; but sufficient justice has not been done to the efforts of Louis XVI. and some of his ministers, who were praised for their patriotic zeal by no less an authority than Edmund Burke. It was Carnot, however, who, by his energy, industry, and perseverance—working sixteen hours out of the twenty-four—created fourteen French armies to meet the coalition of Europe. During that most critical period of 1793 he alone directed the war-office, and traced the plans of the different campaigns. His was the head and hand that corresponded with the generals, without the aid of a secretary or an under-secretary.

These details are necessary to the comprehension of the volume which we have placed at the head of this article, and which is an immense repertory of facts which can be nowhere else found. It is a most valuable mine of information as to the army of France. That army is composed of a staff and a body of troops. The *corps d'état major*, or staff of the French army, is regulated by an ordinance of May 1818, and by ordinances of 1826, 1831, and 1833. Conformably to a recent decree of the 28th June, 1860, the staff is composed, in time of peace, of 580 officers, in the following proportions:—35 colonels, 35 lieutenant-colonels, 110 chefs d'escadron, 300 captains, 100 lieutenants.

There is, supplementary to the staff, an École impériale d'Application d'État Major, created in 1818, with the object of preparing *élèves* for its service. The candidates are chosen by competition from the Imperial Military and Polytechnic Schools. The course of study extends over two years. The head of this school is General Vaudremet Davont.

The troops stationed on the territory of the French empire and in Algeria are, by an imperial decree of the 17th August, 1859, distributed into seven great commands, confided to marshals of France. The first *corps d'armée* is commanded by Marshal Magnan; the second was commanded by Marshal Castellane, recently deceased; the third is commanded by Marshal MacMahon; the fourth by Marshal Canrobert; the fifth by Marshal Baraguay d'Hilliers; the sixth by Marshal Niel; and the seventh by Marshal Pelissier, Duke of Malakoff.

The "Annuaire Militaire," before giving details as to the infantry and cavalry, consecrates a chapter to the Cent Gardes, created by imperial decrees of 1854, 1856, 1858. The uniform of this corps is sky-blue, and it is commanded by Lieutenant-Colonel Verly.

The subsequent chapter treats of the Imperial Guard, reorganized by a decree of the 20th December, 1855. It is composed of 1 regiment of gendarmes à pied, 3 regiments of grenadiers, 1 regiment of zouaves, 1 regiment of voltigeurs, 1 battalion of chasseurs à pied, 1 squadron of gendarmerie à cheval, 2 regiments of cuirassiers, 1 regiment of dragoons, 1 regiment of lancers, 1 regiment of chasseurs, 1 regiment of guides, 1 division of artillerie à pied, 1 regiment d'artillerie monté, 1 regiment d'artillerie à cheval, and a division of engineers. The commander of the Imperial Guard is Marshal Regnaud de St. Jean d'Angely.

Irrespective of the Imperial Guard, there is what is called the Maison Militaire de l'Empereur, the head of which is Marshal Vaillant, Grand Marshal of the Palace. Second to this functionary is the Adjutant-General of the Palace, General Rolin. The Emperor has sixteen *aides de camp*, eight of whom are generals of division, two of whom are generals of brigade, five of whom are colonels on the staff, and one of whom is a colonel of artillery. The head of the Emperor's topographical cabinet is Baron de Béxille. He has also seven officiers d'ordonnance.

The infantry of France is composed of 100 regiments of the line, 20 battalions of chasseurs à pied, 3 regiments of zouaves, 1 battalion of sapeurs pompiers, of the city of Paris, 3 battalions of light African infantry, 5 companies of fusiliers de discipline, 2 companies of pioneers of discipline, 1 foreign regiment, 3 regiments of Algerian tirailleurs, 1 company of veteran sous-officiers, 1 company of veteran fusileers.

In France, as in Austria, the number of cavalry is about the fifth of the force of the infantry. The composition and the organization of the *cadres* of cavalry are regulated by the *ordonnance* of 1841. The cavalry is composed exclusively of the regiments forming a portion of the Imperial Guard, of 12 regiments of reserve, of 20 regiments of cavalry of the line, of 23 regiments of light cavalry, of 3 regiments of Spahis, and of 10 companies of cavalry de remonte. The uniform of the cavalry is sky-blue. The cavalry comprises troops with the following names:—carabineers, cuirassiers, and dragoons, lancers, chasseurs, hussards, chasseurs d'Afrique, and Spahis.

The organization of the corps of artillery is regulated by a decree of the 20th February, 1860, and is based on the effective strength of the army in cavalry and infantry. The number of the corps of engineers is determined by the number of divisions of infantry to which they can be attached, the strong places to defend, and the reserve required for sieges.

The object of the military administration of France, for half-a-century, has been, and is, to proportion the number of recruits to the number of veterans. For this reason the *cadres* of the cavalry are always in greater force than the *cadres* of the infantry, more time being necessary for the instruction of this branch of the service. Squadrons of from 120 to 140 horses should be always complete, for a cavalry-soldier cannot be unprovided. Horses and men must be long trained to work harmoniously together. Man and horse should be identified in feeling and volition; they should be but one entity, and feel the *idem velle, idem nolle*.

There should be a greater number of men than of horses in the cavalry to perfect the trooper in grooming and horsemanship. The Emperor of the French, who wishes to be considered an authority on military matters (though military men smile at many of his views), considers that a great future is opening to cavalry, and that it may be made the right arm of the service. There is nothing new in this view, for from 1750 it has been an object with the French to make their cavalry perfect. The infantry, being much the more numerous body, and equally suited to defiles and to an open country, must be a more every-day, and therefore more useful, branch of the service. The infantry has ever been, and, possibly, will still continue, the strength of all military operations. Cavalry is chiefly dependent for its success on the nature of the ground, and the charge is one of its principal operations; but, in the moment of success and victory, it attacks and overthrows wavering masses, and prevents a rally; while, in a moment of disaster and reverse, it occupies a victor, and often harasses and annoys him. The French cavalry has performed many glorious achievements. In January 1795, when the Texel was covered with ice, it advanced on the gulf with the light artillery and seized on the vessels surprised by the frost and frozen in. At Austerlitz the cavalry made two famous charges, one led by Kellermann, which rendered the victory decisive and glorious. With three regiments of chasseurs and hussars this great cavalry officer broke the left wing of the Russians; while Bessières, at the head of the cavalry of the guard, fell upon the cavalry of the Grand Duke Constantine, and hacked it to pieces.

Cavalry-officers are generally men of some fortune, and more so during the last ten years than at any epoch since the Revolution of 1789; but, unless these officers have soldierly qualities and aptitudes, as well as fortune, their wealth is of no advantage to them in their profession. The French people, envious and jealous of all superiorities of rank or fortune or social pre-eminence, would not be favourable to the continued existence of cavalry, as an arm of the military service, if cavalry did not influence and greatly aid in the winning of battles. This branch of the service undoubtedly wears a more aristocratic air than the line; but it is more than tolerated, nay, it is petted, because it contributes to the military glory *de la Grand Nation*.

During the reign of Louis Philippe a great improvement was made in the saddles, and also in the horses of the cavalry, and the present Emperor has spared no expense to render the horses as perfect as may be. The effectiveness of the French cavalry has been greatly promoted by the school of cavalry at Saumur, and by the schools of equitation at Metz, Douai, Besançon, and Angers. It was in this last school, it will be remembered, that the Duke of Wellington received a portion of his military education. There is a central school of cavalry in Paris for the most promising pupils of the provincial schools. For forty years the breed of cavalry horses has been improving. The late Marshal Bugeaud used to say that it required an apprenticeship of seven years to make a perfect soldier, and that he should be perpetually in training. No army in Europe is so indebted for its successes to its military schools as France. There are the School of Application, the School of Application of the Staff, the Polytechnic, St. Cyr, the Prytanée, the École du Tir, and half-a-dozen others.

The feature, however, which distinguishes the French military system from our own is the conscription. It is a cardinal principle that every Frenchman is a soldier, and "*se doit à la défense de la patrie*. If the soil of France were threatened now, as in 1797, voluntary battalions would assemble. In 1797 France had 690,000 men under arms, and in 1794 more than a million of men. Notwithstanding seventy-four years of changes, revolutions, and political strife and turmoil, France is the country in Europe best prepared to make war promptly and effectively.

The conscription is chiefly managed through the *Conseils de révision et de recrutement*. From the moment a Frenchman is destined for the service, he is subjected to military government. From the tender years of boyhood, scholars in the military schools are subjected to but one motive power, and that one a military power. Thus the aptitude of the nation for war is continually developing and continually increasing. The French army has but one volition. It wills strongly and vehemently the military glory and aggrandisement of France. This it is which renders the army so formidable. Immense power is given to the Minister of War. He is in correspondence with all the commanders and generals of division; he receives all military despatches, orders the movements of troops, and directs and controls the expenses of military expeditions. The present Minister of War is Marshal Randon, who is in his 69th year. He served in the Russian campaign in 1813, was twice wounded at Lützen, and finished his active career in 1857 by the successful campaign in the Kabylia. He has an immense staff under him of general directors, chiefs of division,

chiefs and sub-chiefs of bureaus, and subordinate *employés*, amounting altogether to more than 3000 persons. In the French War-office there is no divided power, no clashing of jurisdictions.

It will be concluded from what we have said that military education is more carefully cultivated in France than in England. The military profession is more honoured, regarded, and appreciated than with us. A great commander is looked on as the king of men. A great commander is more admired in France than a great statesman, law-giver, administrator, or financier. A great commander is worshipped by our neighbours, who too often surrender to him their civil liberties and all that is most valuable to men and citizens. The great bulk of our neighbours, it is to be feared, prefer military glory to civil freedom. A Frenchman is a campaigner by nature and art. He can cook and make sauces, play by turns the tailor, the cobbler, the darner, the washerwoman, and the laundry-maid. He can put himself underground like a beaver, and sing, dance, and play the while, gay and galliard as a lark. He can subsist on vegetables and bread and cheese, and with an onion, a carrot, and a clove of garlic can make a satisfying, if not a solid meal. On this fare John Bull would grow lean or starve, and, before dying, would sulk, grumble, and become unmanageable. When the wise men of this earth, at scientific meetings and congresses, enter into comparisons between the cost of the English and French armies, they should think of facts like these, and remember that Englishmen can neither bake, cook, nor forage like the French. All Irish, and some of the Scotch, in our armies have a good deal of the cooking, foraging, and jack-of-all-trade's talent of the French; but the English are not so limber and flexible.

In our army, too, officers ascend to command by purchase, whereas in the French they ascend by merit and professional knowledge. It should also be remembered that the exact sciences are more studied by officers and soldiers than in England. Yet it cannot be denied that we have the better, nay, the best material in the world, for the making of a soldier. Though our men are not so intelligent, they have more bone and muscle; though they are not so quick at invention, they are less desultory; they have a graver and a higher sense of duty, and a higher standard of principle. For all the purposes of a just and defensive war we are a great military people; and no one can deny that the country of Cromwell, Blake, Marlborough, and Wellington has produced great captains. English soldiers led by a Wellington could achieve anything, and even without a general they were victorious in the Crimea.

We are glad to find fewer Irish names than half-a-century ago in the "Annuaire Militaire." The Roman Catholic emancipation of 1829 has kept many at home who, had it not been passed, would have served the French Emperor. There are still Barrys, Darcys, Morrisses, O'Farrells, and O'Maleys in the French service; but these are the descendants of men who emigrated with James II., or the descendants of the rebels of 1798.

THE MALABAR COAST.

The Land of the Permauls; or, Cochin, its Past and Present. By Francis Day, Esq., F.L.S. (Madras: Gantz Brothers.)

Letters from Malabar. By Jacob Cantor Visscher. *Now first Translated from the original Dutch. To which is added, An Account of Travancore, and Fra Bartolomeo's Travels in that Country.* By Major Heber Drury. (Madras: Gantz Brothers.)

THE store of information comprised in these laborious and accurate volumes would have been a welcome gift, indeed, to the world in the days of the Roman Empire or the Reformation. For many ages, the Malabar Coast possessed a commercial importance of which it is now deprived. The imperfection of ancient navigation, by rendering it the only part of India readily accessible to vessels, made it the emporium of the entire peninsula. In the pages of Arrian we may still trace the slow and wary progress of the enterprising trader, whose return cargo of gems and silk and spices supplied the artificial wants of Europe, and stimulated Western imaginations with visions of a wild and fabulous magnificence. At a later period, the same proximity rendered these shores the scene of the exploits of a Gama and an Albuquerque, and made Goa for a brief space the commercial metropolis of the Indian Ocean. All this is now changed; the coast of Malabar no longer marks the eastern limit of mercantile enterprise; the wealth of the peninsula has found new storehouses and new channels of distribution. Calcutta, Madras, Bombay have risen; Kurrachee and Akyab are rising upon the decrepitude of Goa and the ruins of Calicut. Governed in peace by a handful of strangers, or their submissive native tributaries, these regions rarely occupy the attention of journalists, and are probably less known to the world than any other portion of our Indian dominions. Yet the development that assuredly awaits their vast natural resources will one day render them objects of greater curiosity; meanwhile, the abundant collection of information here presented to us, if containing much of merely local interest, is also rich in particulars attractive from their picturesqueness, or valuable as illustrations of the laws that, operating amid an infinite variety of external circumstances, regulate the moral and material condition of the human race.

The ethnology of the country presents a curious problem at the very first. While in physical constitution, in religion, disposition, and manners, there is little appreciable difference between the people and other Hindoos, the language is altogether distinct, devoid of the least apparent similarity either in vocabulary or construction. Four tongues—the Tamul, Telugoo, Canarese, and Malayalim—compose this group, which philologists have agreed to denominate *Dravidian*, and which, spoken by thirty-one millions of people, is spread over the south of India from Hydrabad to Travancore. Philologists profess to detect an affinity between them and the Tartarian family of languages, which, if taken in connexion with the unquestionable entrance of the Aryan conquerors from the north, renders it nearly certain that these Dravidian nations represent the aboriginal population of the country, driven into a corner like the Welsh and Basques, and gradually yielding to the influence of their invaders so far as to adopt their religion and manners, while, strangely enough, the primitive language remained unaffected. It is indeed highly probable that the aboriginal population was nowhere exterminated or expelled by the Aryans; for the highly plausible theory of the institution of caste having originated in the necessity of protecting the blood of the superior from admixture with that of the conquered race presupposes the existence of the latter in considerable numbers. If so, the entire disappearance of their language on one side of an apparently arbitrary line, and its complete prevalence on the other, considered in connexion with the substantial physical identity of the dwellers on both, presents a very singular and puzzling phenomenon. The theory adverted to derives considerable countenance from the anomalous position of the *Nairs* in Malabar, a class which, although Sudra, or belonging to the lowest of the four great castes, yet constitutes the nobility of the country. It is natural to suppose that these Nairs are either descendants of the aboriginal aristocracy, or that their privileges are a reward for having assisted in the subjugation of the country. The Rajah of Travancore himself is a Sudra, but is always manufactured into a Brahman on ascending the *musnud*, an important part in this transmigration being played by a golden cow, at the mouth of which the Rajah enters a Sudra, and, having crawled along its interior arrangements, appears under the animal's tail as one of the "twice-born." There is an infinite variety of inferior Sudra castes, mostly very much oppressed, which occasions many to become Christians or Mohammedans. Of the Pariahs the writer says:—

> They are pre-eminently a degraded race. When speaking of their bodily members—such as an eye, or an ear—to a superior, they (as must also Chogans, and those inferior to them) prefix it by the epithet *old*—such as "old eye," "old ear." They are obliged to call their children "calves," their silver "copper," and their paddy "chaff." They commence speaking by saying, "Your slave has received permission to observe." Nairs they must call "Kings," and Brahmans they may not approach; they are not allowed to draw near a temple to pray, and must leave the public road to permit those of higher caste to pass undefiled. However the philanthropist may desire it, they can never as a class be elevated by legislation, as the first step must be to raise them in their own estimation; and, until this is gained, they will make no real advance in civilization.

A singular marriage ceremony prevails among another of the low castes:—

> Their marriage ceremony is very simple, but it is also employed by some of the other inferior tribes, at certain times, although quite contrary to their rites. A large round building is made of leaves, and inside this the bride is ensconced. All the eligible young men of the village then assemble, and form a ring around this hut. At a short distance sits the girl's father, or nearest male relative, with a tom-tom in his hands, and a few more such musical instruments complete the scene. Presently the music begins, and a chant, which may be translated as follows, is sung by the father:—
>
> Take the stick my sweetest daughter,
> Now seize the stick, my dearest love.
> Should you not capture the husband you wish for,
> Remember 'tis fate decides whom you shall have.
>
> The young men, each armed with a bamboo, commence dancing round the hut, into which each of them thrusts his stick. This continues about an hour, when the owner of whichever bamboo she seizes becomes the fortunate husband of the concealed bride.
>
> Amongst the Nicomars, the bridegroom on his marriage invariably kills and eats a cat, in which he is assisted by the bride. The bridal feast of the tank-diggers consists of a fox.

The former commercial importance of Malabar has rendered it common ground for many races and religions. Of the Hindoo religion Mr. Day gives a copious account, not, however, containing anything novel. It is easy to trace the gradual degeneracy of this creed from a pure and sublime conception of Deity to a monstrous polytheism, and to observe how, in India as elsewhere, the corruptions have been introduced by the priestly caste, whose original motive was self-interest, but who have ended by believing their own impostures. The bulk of the Christians are divided into Syrians, Romo-Syrians, and recent converts to the Roman Catholic faith. It seems uncertain whether the Syrian Christians, now physically undistinguishable from the natives, were originally Hindoos, or a mercantile colony from Europe. If we may credit a very ancient tradition, their forefathers were the converts of St. Thomas, who, according to one account, was martyred in the country; but, according to another, accidentally killed by an arrow aimed at a peacock. They certainly existed at the time of the Council of Nice, and were at one time independent under princes of their own. The Portuguese found them in a declining condition, though still possessed of many privileges, and speedily took steps to reduce them to the Roman obedience. This object frequently seemed to be attained; for the Syrian prelates, when hard pressed, were always ready to make any submission, and take any number of oaths, but never failed to break them at the first opportunity. The pacification temporarily effected by Archbishop Menezes is amusingly characteristic of theological controversy in India and elsewhere:—

> However, there was one thing which they unanimously agreed in declining to give up, and that

was the ancient custom of praying in the Syriac tongue, declaring that they would rather sacrifice their lives than pray in Latin. Considering that they were equally ignorant of both these languages, religion could scarcely be considered as being much benefited by the refusal. Menezes, seeing that on this point they would not yield, conceded the question, as they had allowed all errors to be expunged from their liturgy; and so the Romo-Syriac Priests continued to pray in the Syriac language, although very few amongst them comprehend it in the smallest degree.

Some of these churches remained in communion with Rome, and are now known as Romo-Syrian; the rest—chiefly, it must be confessed, by means of disssimulation and deceit—preserved their independence till the danger was removed by the expulsion of the Portuguese by the Dutch. The creed of this very ancient church is Jacobite; its administration is sadly disorganized through the contending pretensions of the various bishops sent out by the Patriarch of Antioch, who claims an authority which he is too remote to exercise to any good purpose. In 1848 there were five such bishops in Malabar, each denouncing the rest as intruders. Great abuses naturally prevail, many of the clergy being, for the sake of fees, ordained when mere infants. We must refer to Mr. Day's volume for an interesting account of their liturgical observances.

The Jews, divided into white and black, form another interesting element of the population. The white Jews are immigrants, continually renewed by fresh arrivals, without which they would speedily become extinct. They are a handsome race, many of them even fairer than Europeans. The black Jews are native proselytes, contemned by their co-religionists, and living in constant feud with them on that account. However, they are very orthodox, and lament the destruction of Jerusalem with as much fervour as if they knew anything about the history of the city, or had the remotest idea in what part of the world it was. It is similarly observed that the *Moplahs*, or low-caste converts to Mohammedanism, are more zealous than the original believers. They are chiefly the descendants of those forcibly converted to Islam during the Mohammedan dominion, and who, finding their social position improved by the change, have not merely continued in their new faith, but have become zealous for its propagation. This fact might suggest a better method of action to the Christian missionaries, who might find it more to their purpose to assail the tangible abuses of caste than to encounter the natives on their own ground. Should miracles be adduced, the Hindoo closes discussion by bringing forward greater. He points to Malabar as having been created for the Brahmans, or talks of the bridge to Ceylon erected by Hunaman and his monkey-army." The proofs of some of these miracles, it seems, are very compendious and easy to produce:—

As Hunaman was enacting the spy, he unfortunately was made a prisoner, when, as a punishment, his tail was oiled, and then set fire to. Attempting to blow out the fire, his face became singed, and permanently blackened; so all his tribe had their physiognomies turned the same colour, which, should any one doubt, they have only to examine the Hunaman monkey, *Semnopithecus entellus*, which, with its black face, may to this day be found along the western Ghauts.

After Vishnu, in the form of Rama, had killed Ravana, the wife of the latter came and prayed for a blessing, and he promised she should never be a widow. Then, discovering to whom he had made this promise, he directed Hunaman to constantly heap up wood on Ravana's funeral pyre, which he continues until the present time. Until the fire goes out, Ravana's body cannot be considered to be consumed, and, until it is, his wife is not a widow. Should a Hindu be asked for a proof of the truth of this, he directs one to place a finger in either ear, when the noise of the fire still burning may be distinctly heard.

Some of the notions of the natives with respect to the zoology of the country are very singular. The Hunaman monkey, according to them, never dies a natural death. Another species brings luck if seen first thing in the morning, and is often kept tame for the purpose. Tigers who have killed a man are safe from all attacks, as the spirit of the slain person sits on their foreheads and guides them from every danger. Some tigers are men transformed by magicians. These may be recognised by a lack of tail. Some foxes are believed to have horns on their foreheads, the possessor of which will be enabled to cheat with impunity. They are naturally in great request. Certain species of lizards are execrated by Mohammedans, who regard their bowing motions as intended to mock the true believers.

Mr. Day's work abounds with other interesting matter, to which we cannot even allude. The other book before us is also very interesting, but goes to a great extent over the same ground as Mr. Day, whom we have preferred to follow as the more recent and copious authority. The writer was Dutch chaplain at Cochin about 1723—a genuine Hollander, dry, accurate, and shrewd. He evidently looked with great distrust upon the English, and entertained a just presentiment that they would one day expel his countrymen from their settlements. Unlike the Portuguese, the Dutch never struck any root into the country, and at the present day scarcely a trace of their occupation remains.

A GERMAN HISTORICAL PAINTER.

Beiträge aus Würtemberg zur neueren Deutschen Kunstgeschichte. Mitgetheilt von Professor Dr. Ad. Haakh. Mit einem Portrait Gottlieb Schick's, und fünf Radirungen nach Retsch, Wächter, Schink, Dannecher, und Scheffauer. (Stuttgart.)

FEW books are more engaging than those revealing the lives of eminent individuals; and the lives of great painters, especially, are almost more interesting than those of any other class of men. They seem to be a different race of beings from ourselves—to speak a different language; we are curious to trace the connecting link between painters and books, and to find out how colours will translate into words, and what kind of persons are those who talk by natural signs transferred to canvas. We were, therefore, glad to hear that the letters of Schick, the painter, had been printed. We knew little of this artist; but the little we did know excited our interest. During the exhibition of paintings at Munich in 1854, we found his name, associated with those of Carstens and Wächter, as one of the three great reformers of historical painting in Germany; but little else was known of him. His early death prevented him from producing a larger number of works; and those he painted were much scattered, though, at present, two of his finest, "David before Saul" and "Apollo amongst the Shepherds," are the gems of the Stuttgart Gallery. If his *chef-d'œuvre*, "Noah's Sacrifice," were added, we should have the rare spectacle of examples of the successive stages through which the rising genius of Schick passed. The war which almost immediately followed Schick's death is another cause of his being little known. A new generation forgot the master who first showed them the right way; and we have to thank Professor Haakh, who takes such a lively and laudable interest in the fine arts, for editing Schick's letters, and adding to them his four academical lectures, held at the Stuttgart Institution of Art. In the preface there are some excellent remarks on art in general; on Eberhard Wächter, whose picture of "Job" forms one of the greatest attractions of the Stuttgart Gallery; on the works of Dannecher; on historical painting, &c. "I entertain no doubt," says the editor, "that the future historical painter will have to study closely, not only the art of painting, but history itself. And how can the painter of smaller subjects (*genres*) gain the necessary knowledge of human nature by merely observing familiar objects? With a knowledge of history and the classics he will obtain a juster conception and a more scrutinizing eye for every-day life. If the instruction of our young artists in our academies and institutions of the fine arts were raised to a higher standard, we should not have so much reason to complain of the want of historical paintings, as we have now of the superabundance of *genre*-pictures, representing either mere trivialities, or, worse than that, mere frivolous subjects."

The four academical lectures, or, as the author calls them, "Historical Sketches of Art," contain short accounts of the teachers and pupils of the "Académie des Arts," an institution of the Duke Charles Eugene of Würtemberg, the founder of the famous "Carlsschule." We have some account of the Duke himself, of the lives and works of the more or less celebrated painters and sculptors who obtained their education in the "Carlsschule" and in the "Académie des Arts"—Gimbal, the pupil of Raphael Mengs, and one of the principal teachers of the "Académie;" Retsch, whose outlines to Goethe, Schiller, and Shakespeare are, perhaps, more widely known than his clever pictures; Wächter; Koch, famous for his historical landscapes not less than for the originality of his character, the great admirer of Dante and Homer; the historical painters Ferdinand Hartman and Gottlieb Schick; Müller, the engraver; and, finally, the "Royal Institution at Stuttgart" itself. But, as it is Gottlieb Schick to whose memory the work is sacred, we must confine ourselves to him alone.

Gottlieb Schick was born at Stuttgart on the 15th of August, 1779. His father, prejudiced against an art which did not pay, opposed his son's inclination to become a painter, until a portrait of the father, still in existence, and praised as the work of a mere boy, made the parent relent, and decided the fate of the future artist. Schick became the pupil of Retsch and Dannecher; and it was especially the latter to whom he was most deeply attached. When at the age of nineteen he went to Paris to study under David, where he remained four years, but without making the progress which his friends at home expected. His genius widely differed from that of the great Frenchman. That of David had a tinge of theatrical mannerism—Schick's was nature itself. The young man's object was to see Rome; and, after a short stay at Stuttgart, he travelled by way of Munich and Venice to the eternal city, where he arrived in the autumn of 1802. Here the ardent soul of the young man "took fire." Like many before and after him, he became a worshipper of the very soil on which he trod. His first great picture, "David playing before Saul," now in the Stuttgart Gallery, gave him at once a good name. Wilhelm von Humboldt, whose house was at that time the general resort of the artists of all nations, became his friend; and he formed acquaintance with Tieck, A. W. von Schlegel, and others; whilst he became the idol of his contemporaries, not only as a painter who loved his art, but also as a high-minded and poetic young man.

His second great picture was "Noah's Sacrifice after leaving the Ark," a work of which Schlegel wrote to Goethe: "I cannot praise the artist higher than by saying that he thoroughly understood and felt the dignity and breadth of his subject." In July 1805, he exhibited this picture in the Pantheon, and "all who took any interest in art, went to see and to admire it; the place before the Pantheon was often stopped with carriages." This picture, and some portraits of the Humboldt family, painted by Schick, were afterwards exhibited at the house of the Bavarian ambassador. These exhibitions, as well as that of some of his pictures and portraits in the *Capitale*, established his fame; but the reception of "Noah" at Stuttgart was rather a cold one. He received a poor remuneration, and, to sustain life, had to paint portraits—a thing he disliked, though excelling in it. In 1807 he married the daughter of Mr. G. A. Wallis, an Englishman, better known as a collector and picture-dealer than as a painter, though his landscapes show a genial and deep conception. The tale of Schick's love we find in his

letters, chiefly addressed to his brothers and sister, to Dannecher, &c. He remained in Rome with his wife and young family until 1811, painting, amongst other larger pictures, his "Apollo among the Shepherds," and many portraits; but his failing health compelled him to leave the metropolis of arts. After an absence of nine years, he reached home, received with the greatest attention and respect; but he died some months afterwards, not having attained his thirty-third year.

Schick was one of the first who fully entered into the spirit of Carstens, and substituted *nature* for the theatrical mannerism of the French school. His ideas were lofty, his figures and his colouring more powerful and fresh than that of Wächter, or even of Carstens himself. He was, doubtless, one of the first and most energetic reformers of painting Germany has produced; and, though the French war which followed soon after his death made a newer generation—amongst them Cornelius, Overbeck, W. Schadow, Schwind, Lessing, Kaulbach—forget their great prototype, yet Schick will ever be considered as the founder and reformer of this branch of art.

A few extracts from Schick's letters will tend to illustrate the character of the artist and the man, and the manners and customs of the Italians in the beginning of this century.

To Dannecher (Rome, October 22nd, 1802):—

I am greatly pleased that I can write to you from Rome. It is ten days since I arrived here; but it seems but a day. I am bewildered, and as if dreaming. Before I went to Rome, I could not understand how Raffaelle could have painted so many beautiful heads; now, being in Rome, I wonder why others, who trod the same soil, did *not* paint equally beautiful faces. All faces here, even those of the beggars (who form the greatest part of the population), have a vast deal of expression, and contrast strongly with the round and meaningless faces of our German countrymen. Amongst the women you see sometimes a Juno, a Minerva, or a Venus. They all are beautiful—all!

And to his friends at home (Rome, 17th November, 1802):—

You cannot believe what a beautiful country this is. Every morning when I awake I hear the song of the birds, just as with us in May; and I can scarcely yet understand that the year is dying fast. This, and the works of art here heaped together, are the chief attractions this country has above others; not one of the comforts of human life is to be met with. The lower and lowest classes, especially those of Rome, rather beg than gain their livelihood by honest work. The Pope's government is the worst possible. The princes hold the land in their hands, and allow half of it to lie waste and uncultivated, in order "that the corn may fetch a higher price."

To the same (Rome, February 3rd, 1803):—

I am in Rome, for which I longed when a child; but the spectacle of so many poor and wretched people makes me feel uncomfortable and depressed. I am, therefore, much in my own room; paint, and study, and work day and night, that I may become and accomplish something great and good in this world. No sacrifice is too great for my ambition, provided I can obtain it by my industry.

To Dannecher (Rome, April 7th, 1804):—

The subject of my new picture is again taken from the Old Testament: it is the sacrifice of Noah. I like to choose well-known subjects, and at the same time those which are venerable and sacred. Every one knows them at first sight, and directly judges of the impression the subject and the picture make upon him. I am at this moment not decided if I shall represent God, the Father, in it or not. I should like to have your advice. . . . . If heaven gives me health and serenity of mind, I am quite sure to paint a better picture than my last.

To his friends at home (Rome, July 28th, 1804):—

I received your letter after having returned from a short excursion into the Sabine Mountains, whither I went with Koch. I was absent for a week, and must in a few words tell you how I have spent this time. We went from Rome to Tivoli, already described to you, and where we found landscape-painters of all nations, who combined study with enjoyment of life, having concerts and private theatricals, &c. We remained two days at Tivoli, time enough to cram my head with theatrical conversation. . . . The third day we went through the mountains to Subiaco, a little town about fourteen hours' ride from Rome. On our way to it we passed through a village, which struck us by its almost incredible poverty. Asking for an inn, they showed us the only one of the place. It was a black hole, in which men and pigs huddled together. There was nothing to eat but figs and eggs; we had neither knife nor spoon—only a bad dirty fork with one prong, a rag of table-cloth, dirty as if it had served in a pig-stye, wine like vinegar mixed with gall. A pig came to us in the most affectionate way to partake of our meal. The poverty of these wretched people is almost incredible, and excited us much against the priest-government, the cause of all this evil. . . . .

To Dannecher (Rome, July 26th, 1805):—

My picture ["Noah"] is now exhibited in the Pantheon, and has obtained the greatest praise from the French, the Italian, and the English; only the Germans formed two parties, one for, the other against, the picture. Those who are favourable show me the greatest respect, ask my advice, &c.; but the others try everywhere to avoid me. Both go too far in their opinions: for I am persuaded that it is neither so good as some, nor as bad as others, wish to make it. The first artists—French, Italian, and German—have overloaded me with praise, and unanimously say that the picture is one of the best of modern times. If I had a cheerful mind, I might be pleased and contented with myself. But this is wanting! If formerly I should have thought that one day I should become one of the first artists, honoured and esteemed, I should have been proud and vain beforehand. But now, having all this, what "am I?" Am I happy? I see a day-labourer is more so than I!

To Dannecher (Rome, August 23rd, 1808):—

Here in Rome is a certain sculptor, a Dane, of the name of Thorwaldsen. His last work, a Mars, is of great beauty, a wonder of the present time. He is now executing an Adonis, which promises to become equally beautiful. Canova, of whom you will have heard much, produced a great many statues: few amongst them are really good, many are mediocre, some even bad. Thorwaldsen is far above him in every respect.

And to his friends at home—one of his last letters (Rome, October 14th, 1810):—

My brother asks me about the subject of my new picture, which, as I told you, shall become better than anything I have done. The subject is *not* historical, but thoroughly symbolical. The picture represents Christ in the age between youth and manhood; he sleeps on clouds in the arms of angels, spreading their wings over him; the cross, surrounded by a glory, appears before him in his dream, and he stretches his arms towards it; angels kneel adoringly before him. The meaning of it is: the first presentiment of his sufferings for the redemption of mankind. I could still further analyse this thought; but you will understand it.

The letters of Eberhard Wächter (forty-one in number) to a friend contain some good ideas about art, artists, the subjects of his pictures and drawings, and his longing for Rome—his innermost thought.

The work is well got up; whilst the portrait of Schick, as well as the five etchings after Retsch, Wächter, Schick, Dannecher, and Scheffauer, form an acceptable addition.

EGYPTIAN MYTHOLOGY AND CHRONOLOGY.

The Pharaoh of the Exodus: An Examination of the Modern Systems of Egyptian Chronology. By D. W. Nash, Author of "Taliesin," &c. (J. R. Smith.)

Egyptian Mythology and Early Christianity, with their Influence on the Opinions of Modern Christendom. By Samuel Sharpe, Author of "The History of Egypt. (J. R. Smith.)

WE have here two more books upon Ancient Egypt—an inexhaustible subject, but one upon which it is difficult now to say anything new that can claim to be more than a tolerably probable conjecture. Mr. Nash attacks the most intricate of all the problems connected with the country—that of its chronology; Mr. Sharpe takes the less perplexed, but still sufficiently abstruse, topic of the religion of the people. Both books deserve a few words at our hands, one for its intrinsic merit, the other on account of the reputation of the writer.

Mr. Sharpe is well known as the author of a very popular "History of Egypt," a work in two octavo volumes, which has reached a fourth edition. He has also published a volume of Egyptian Inscriptions, containing 216 plates, in folio. Several little *brochures* on Egyptian subjects have likewise proceeded from his pen, as an account of the "Egyptian Antiquities in the British Museum," a list of "Egyptian Hieroglyphics, with a Vocabulary," a sketch of "Alexandrian Chronology," &c. He is an honest and diligent student in this branch of antiquities, and deserves to be heard with attention so long as he confines himself to it. It may be objected that he is not very deep, nor very original; and this is true. But he is a careful compiler; he has a lively style; and he presents us with very pleasant summaries of the information which the monuments of Egypt have been made to yield by profounder scholars and critics, such as Wilkinson, Stuart Poole, Lepsius, De Rougé, Brugsch, and Birch. In the present instance he has epitomised sufficiently well the elaborate accounts, which have been given by some of these writers, of the Egytian religion, and has presented to us in less than seventy small octavo pages a very readable sketch of the chief points in the Egyptian worship and religious belief, illustrated by some eighty wood-engravings.

It would have been well if Mr. Sharpe had stopped here. But he is ambitious of a double reputation. He would be known, not only as an Egyptologer, but as a theologian. He has already translated the New Testament from Griesbach's text, and written "Critical Notes" on the authorized English version of the same. And now he comes forward to throw light on the history of Christianity by means of his Egyptian studies. He is a Unitarian; and it is therefore perhaps not very surprising that his studies lead him to believe that Christianity was corrupted by contact with the religion of Egypt. To this source he ascribes the doctrines of the Trinity, the Incarnation, and the Atonement. It would have been curious and interesting had Mr. Sharpe, while stating these conclusions, carefully collected from native and classical sources all that in the Egyptian system has any resemblance or analogy to these Christian truths. We could then have judged for ourselves of the amount of real similarity, and we could have drawn our own conclusions as to the ground and nature of the resemblance. But Mr. Sharpe has given us no opportunity of forming a judgment. He has presented us with certain foregone conclusions of his own, and he has supported them by a few very obvious facts, which have long been known, but have never been felt to possess much importance. With respect to the Trinity, he has merely shown that the Egyptians were fond of arranging their gods in groups of three (pp. 13, 14), and that in some cases the priests mystically declared that the three gods of a group were in some sense but one god. And here he has left the subject. Obviously he has proved, not the Egyptian belief in the doctrine of the Trinity, much less the derivation of the Christian doctrine from the Egyptian, but only the Egyptian admission of certain triads or trinities (if the word is preferred) into their system, which (as he elsewhere allows, p. 2) was one of the most extended polytheism. That is, he proves much less than Cudworth thought that he had proved (*Intellectual System of the Universe*, ch. iv. sec. 16), and regarded as confirmatory of the general creed of Christendom! On the subjects of the Incarnation and the Atonement he is equally weak: merely repeating, in the one case, the well-known story of Osiris, and, in the other, proving, not that the Egyptians had One Mediator,

and him identical with the God-Man who had been born into the world and suffered death, but that they had *four* mediators, who were "lesser gods," not connected with Osiris, and not contained in any trinity or triad. It is evident that these arguments are such as can have weight only with persons predisposed towards the conclusions they are meant to establish. They show analogies, more or less close, between certain portions of the Egyptian religion and some leading doctrines of Christianity. They show nothing as to the ground and origin of the analogies in question, which some would hold to be primeval revelation, some reason or spiritual insight, and some the adoption into the Egyptian system of ideas contained in the sacred books of the Jews.

We turn with pleasure from Mr. Sharpe's religious speculations to the chronological calculations of Mr. Nash, albeit the subject of chronology is in itself somewhat dry and unattractive. Mr. Nash's work is in a great measure controversial. After a brief enumeration of the chief materials for Egyptian chronology, he employs himself in examining at length the various chronological systems which have been founded upon these materials. These systems he divides into the historical and the astronomical. "Most of the systems of Egyptian chronology," he observes, "have rested more or less on some historical basis. To Lepsius a certain passage of Syncellus, to Bunsen the same passage and the list of Eratosthenes, and to Le Sueur and Palmer the Old Chronicle, have furnished the standard by which to measure the chronology of Manetho" (p. 107). That chronology has in every case formed the substratum of the historical systems, which could not stand a moment without the support they derive from it. But Manetho is himself untrustworthy. "The chief source of error lying deep in the list of Manetho itself, all effort to accommodate this latter to any standard whatever has hitherto failed." (*ibid.*) As M. Rougé observes—"The lists of Manetho, containing the succession of the Egyptian dynasties, accompanied by chronological dates, have been the ordinary source employed in the attempt to construct a chronology for Egyptian history; and, but a few years since, there was a disposition to consider these an infallible criterion. As soon, however, as these lists came to be confronted with the monuments, it became necessary to modify this opinion. Though the lists of Manetho have a certain importance, . . . the figures which we now find attached to them have not been able to sustain a critical examination founded on the evidence of the monuments." (*Notice sommaire des Monuments Egyptiens du Musée du Louvre.*) Thus there is a fatal weakness in the very basis and foundation of the existing historical systems, which are also unsatisfactory because they arbitrarily adopt some further criterion, selected at will, whereby to control and modify Manetho's chronological statements, with which no modern chronologer is altogether satisfied. The statement of Syncellus so valued by Lepsius and Bunsen—the list of Eratosthenes—the views of the Old Chronicle, have nothing about them that commands general approval. They are merely *fancied* by particular writers, who choose to invest them with a character of authenticity, which others may deny to them with at least equal plausibility. The result is, that no scheme of chronology can be constructed for Egyptian history, from the historical data in our possession, on which the least confidence can be placed, or which can claim to be more than a conjectural arrangement of numbers that have come down to us on authority quite undeserving of reliance.

After thus disposing of the historical systems of Bunsen, Lepsius, Palmer, Le Sueur, and others, Mr. Nash proceeds to a review of the systems, which he regards as based mainly upon astronomy. And here we must confess that we experience a difficulty in following him. Sothic cycles, phœnix periods, heliacal risings, vague years, tetramenies, epagomenæ, and the like, constitute a scientific jargon which we doubt our ability to apprehend exactly, or to explain intelligibly. We think, however, it would not be difficult to show that as much uncertainty—though of another kind—attaches to the astronomical data for Egyptian chronology as to the historical. In the first place, there is the question of correct interpretation, which (without going the lengths of Sir G. C. Lewis) we think open to some doubt. Next, there is the possible carelessness of the scribes, who, according to Lepsius, frequently made mistakes in their engraving. Then there is usually a doubt as to the part of Egypt where the observation was made, which, in a country extending over seven degrees of latitude, may make a difference of nineteen or twenty years. And, finally, there is the question as to how far modern astronomers can calculate back thousands of years with real historical certainty. Moreover, the observations, being irregular and occasional, can, at the best, only furnish a few separate and isolated dates, and are insufficient by themselves for the construction of a complete chronology. In some instances there is also a doubt as to the king to whose reign they belong, as in the case of one greatly prized by Mr. Nash, which he assigns to Thothmes III., while others have regarded it as belonging to the time of Rameses II. or Rameses III. (p. 128).

For our own part, we believe that Egyptian chronology cannot be carried back *with accuracy* beyond the accession of Tehrak or Tearco, the Tirhakah of Scripture. Assuming that Cambyses conquered Egypt in his third year, or B.C. 525, the Apis *stelæ* discovered by M. Mariette give B.C. 664 for the accession of Psammetichus I., and B.C. 690 for the first year of Tirhakah. Beyond this, all is uncertain. For the reigns of the Shebeks (Sabacos), Tirhakah's predecessors, we have only the authority of Manetho, whose numbers as to the later kings are often erroneous, and who, therefore, can still less be trusted as to the earlier ones. Our continuous chronology is consequently stopped; but we have still a few synchronisms, which are of great importance as landmarks of history, enabling us to fix the position of several earlier Egyptian periods, relatively to the sacred and other annals, if not with precision, yet with tolerable certainty. That Sargon was contemporary with one of the Sabacos appears from a seal found at Koyunjik bearing the cartouche of a Shebek, and in close proximity with records bearing Sargon's name. This would place the Sabaco in question in the latter part of the eighth century, about B.C. 710 or 720. If we may regard the Zerah (Zerach) of 2 Chron. xiv. 9, as an Egyptian monarch, and identify him with one of the Osorkos, we may say that the twenty-third Egyptian dynasty was in power about B.C. 950-910—the time of Asa. And the twenty-second dynasty, which commenced with Sheshonk I. (Shishak), may be certainly fixed to the earlier half of the tenth century B.C. by the well-known synchronism between that king and Rehoboam (1 Kings, xiv. 25). Beyond this we do not feel that we can go. We cannot identify the Pharaoh of the Exodus. Whether he is Rameses II., as M. de Rougé supposes, or Menephthah, his son, as Lepsius argues, or Thothmes III., as Mr. Nash thinks he has proved (p. 315), or some other monarch not yet suggested by any one, seems to us wholly uncertain. The *primâ facie* evidence derived from the building of the city Rameses (Ex. i. 11), that the king himself bore that name, or at least belonged to a Ramesside dynasty, is met successfully by Mr. Nash (pp. 260, 261), who shows that the name of Rameses was borne by a son of King Aahmes, of the eighteenth dynasty, and may have been borne by Heliopolitan rulers even earlier. But the destruction of this supposed piece of evidence (Lepsius, "Chronology of Egypt," p. 426, E. T.) leaves us wholly in the dark as to the king's name or dynasty, and opens the door to interminable doubt and conjecture.

Still, while these are our convictions, we must, in justice to Mr. Nash, distinctly call attention to the "proofs" which have satisfied him that he can construct as well as destroy, and lead him to conclude that the Pharaoh of the Exodus is Thothmes the Third, of Manetho's 18th dynasty, and that the date of the Exodus itself can be fixed to "about the year B.C. 1444" (p. 281).

Confining himself to the Jewish records, he finds (assuming the date of Solomon's dedication of the Temple to be B.C. 989*) that the Exodus was placed by the Jews in B.C. 1464, or B.C. 1424, the Hebrew Scriptures giving 480 years between the Exodus and the dedication (1 Kings vi. 1), while the Septuagint interpreters give 440 years. Assuming the mean between these two numbers, 460 years, which he thinks agreeable to the chronology of the Book of Judges, he places the Exodus—from Jewish evidence only—in B.C. 1444.

Confining himself to Egyptian records, he finds that, in and about the year B.C. 1444, Thothmes the Third was King of Egypt. This fact, which few Egyptian scholars admit, rests entirely upon a single astronomical inscription, a "calendar fragment" found at Elephantine, and believed to belong to a temple built by this Thothmes. (It is to be remarked that the name of Thothmes does not appear in the inscription, and that M. de Rougé ascribes it to the time of Rameses II. or Rameses III.)

Turning to Manetho for the native history of Thothmes, he finds that the great Egyptian writer placed in the reign of this king a remarkable Exodus, which he called that of the Hyksos or Shepherds, "a people of foreign origin, who had been located in the Delta, and in, or in the neighbourhood of, the city of Tanis or Zoan. This people, according to Manetho, on departing from Egypt with all their cattle and possessions, settled in Palestine and built the city of Jerusalem."

The result is that "two perfectly distinct and independent chains of evidence, widely separated at one extremity, meet in a point—the migration of a foreign people from Egypt about the year B.C. 1445." It is therefore "impossible to doubt that the expulsion of the Hyksos, related by Manetho, is the Egyptian history of the Exodus of the Hebrews related by the writer of the Book of Exodus"—and further, it is "impossible to doubt that the true date of this event is about B.C. 1445" (p. 281).

Judicent periti. We are afraid that it will still be found by a large number of persons very possible to do what Mr. Nash pronounces impossible—that they will be inclined to say he has manufactured his coincidence—and that they will ascribe very little weight to the famous "fragment of a calendar from Elephantine," found built into a modern wall, and supposed to have belonged to a temple supposed to have been built by Thothmes III., containing, however, other calendars set up by much later kings, as Mr. Nash himself confesses (p. 128). G. R.

NOTICES.

The Genuineness of the Book of Daniel asserted on Evidence External and Internal. By J. Conway Walter, B.A., Curate of Trinity Chapel, Brighton. (Longman & Co. Pp. 218.)—THE author of this volume thus explains its purpose and nature:—"The present work is a humble attempt to establish the genuineness of a portion of the divine Word, against which the hosts of assailants have rallied, and the tide of war has broken, again and again. Impregnable, indeed, the author believes the position of the Book of Daniel to be, as of any other book of Holy Scripture; yet the frequency and obstinacy of these attacks seem to him to call for the continual reiteration of the evidence of its strength. For this purpose, however, he has not thought it necessary to undertake the refutation

* This number, which produces the *exact* coincidence dwelt on by Mr. Nash, is one which has no authority. The Hebrew numbers of the Books of Kings, applied on Usher's principles to the Canon of Ptolemy, produce B.C. 1012 for the dedication, and consequently B.C. 1492 for the Exodus. Clinton's careful analysis (*Fasti Hellenici*, vol. i., appendix) reduces both dates by a few years only.

in detail of all the arguments which ingenuity may have employed against the book—arguments which are ever shifting their ground, and assuming new forms, as the old become untenable; but, taking his stand on the book itself, as on holy ground, to show its own subjective truth and strength. Still, in doing this, he has not unfrequently found himself, as it were, wielding the sword in one hand while grasping the trowel in the other—though strengthening his own position, and making that his aim, yet, at the same time, by a kind of bystroke, rebutting an enemy's blow as well. So that the reader will here find the chief objections of opponents all, in this way, incidentally touched upon and stated. . . . . It may perhaps prepare the reader for a more intelligent perusal of the following pages briefly to state here the substance of the charges which have been brought against the book they are designed to defend. Porphyry, who lived about A.D. 233-305, wrote a work, entitled 'Against the Christians,' the 12th and 13th books of which were devoted to the examination of the prophecies of Daniel; and he alleged that their minute agreement with the events of the reign of Antiochus Epiphanes was such as proved that they must have been composed *after* those events had taken place; in other words, that the book belonged to a period later by 400 years than the date at which Daniel himself must have flourished—consequently, that it was a forgery. This argument, supported by other collateral ones, some of which, it is probable, were suggested by doubts thrown out by Spinoza, was revived by the English deist, Collins, in the last century. His views again were adopted, in Germany, by Michaelis and Eichhorn, and more recently, to a large extent especially by Bertholdt, Bleek, Gesenius, Von Lengerke, De Wette, Kerms, Scholl, Maurer, Hitzig, Ewald, Lücke, and others. To whom may be added our own Arnold; and lately Dr. Williams, in the work entitled 'Essays and Reviews.' Though varying in the grounds on which they are based, the allegations of these several writers (which it is unnecessary to specify fully here, as they will appear in the body of the work) amount in the main, to the same charge—viz., that the book is a forgery. On the other h nd, there have not been wanting defenders of the book. Collins was answered, and fully, by Bishop Chandler and Dr. Samuel Chandler; as also, though briefly, by Bishop Newton, in his work on the Prophecies. More recently the same line has been taken, and at greater length, by Hengstenberg, Sach, Hävernick, Reichel, Keil, Schulze, Delitzch, Vaihinger, Auberlen, and others, in Germany; in America, by Professor Stuart and Barnes; and, in our own country, by Tregelles, Davidson, Ayre (the two latter in their editions of Horne's 'Introduction'), and many others on a smaller scale. None of these writers, however, have attempted to work out the *internal* evidence to the extent of which it seems capable. It will be seen that it is more especially to this part of the subject the author of the present work has given his attention; supported, as he is, in his opinion of the importance of this kind of proof, by the precedents of men of such calibre as Paley and the late learned Professor Blunt." It may be sufficient to add to these indications of the nature of the work by the author himself that it is divided into three parts—Part I. being entitled "The Argument in favour of the Book's Genuineness from its *Antecedent* Probability;" Part II., "Evidence of the Book's Genuineness drawn *indirectly* from the contents of the Book itself, its language, style, matter, &c.;" and Part III., "The *Historical* Testimony, tracing the Existence of the Book up to a Time when Forgery would be impossible."

The Anti-Slavery Cause in America and its Martyrs. By Eliza Wigham. (A. W. Bennett. Pp. 168.)—THE authoress in her preface says that the incidents in this little volume "have been carefully gathered from the most authentic sources, with an earnest desire to adhere strictly to truth in fact and inference, and to leave the narrative and the actors to speak for themselves;" and, in glancing through the work, always keeping in mind the writer's point of view, we have come to the conclusion that her "facts" are reliable and her "inferences" fair and just. Considering, indeed, the exciting nature of her narrative, she is temperate and judicial; and, by all who have the Emancipation cause at heart, her "brief summary of events that have marked the anti-slavery enterprise in America" will be read with much interest. "The first abolition society," she tells us, "was formed in Philadelphia in 1775 by a few benevolent persons of different religious denominations, the majority of whom were members of the Society of Friends, to which body belonged Anthony Benezet, the most active anti-slavery worker of the period. He was the friend and correspondent of Granville Sharpe and the Abbé Raynal, and, in after times, of Thomas Clarkson. The child of wealthy Huguenots, who escaped from France, after the revocation of the Edict of Nantes, when Anthony was an infant, he inherited the love of civil and religious liberty, which in his matured philanthropy he extended towards all the nations of the earth." The ground over which the authoress travels extends from this period of 1775 down to the last annual meeting of the American Anti-Slavery Society held at New York in May of the current year. "Between 1774 and 1787 all the slaves held by 'Friends' were liberated; and ever since slaveholding has been an offence visited by disownment from their fellowship." "Had this course," she thinks, "which was also that of the Scottish Covenanters from their first settlement in America, been faithfully pursued, the present awful crisis could never have happened." "On the American Church," she thinks, "mainly rests the guilt of fostering slavery"—and throughout her work there is abundant proof of the truth of the statement—and on the American Church she "lays the burden and responsibility of this war." The following extract, with which we close our notice, is very much to the purpose, and seems to explain to us satisfactorily why slavery has existed so long. "It is probable the system might have gradually died out altogether, had not the gins been invented, by means of which cotton wool is much more easily prepared for market: so that the cultivation of cotton began to be very profitable, the value of slavery became proportionally increased, the southern planters kept therefore a tighter hold on their valuable *property*, and, to propitiate them in order to promote their own profitable commerce with the south, the northern merchants attempted to gloss over the iniquity of slavery, whilst the ministers and churches lent themselves to this matter. They received slaveholders to their communion, accepted their contributions for missionary and other benevolent objects, and threw the mantle of church fellowship and sanction over the slaveholder and his deeds. Thus the progress of emancipation was arrested, the hold of slavery on the nation grew stronger and stronger, and the leprosy speedily tainted the whole civil and religious society of America."

Prize Essays on Physical Education. (Longman & Co.)—THE Athletic Society of Liverpool offered prizes, it seems, for the best essays on physical education; and before us are the productions of the three successful competitors. The first prize was carried off by Luke Owen Pike, M.A.; the second, or silver medal of the Society, by Lord William Lennox; and the third, or bronze medal of the Society, by Rowland Evans. The first is, perhaps, the most philosophical, the second the richest in historical allusion, and the third the most familiar and chatty; but all three are positively good, and it is with a perfect confidence that we recommend their serious perusal to our readers.

The Forest Cave; or, Revenge. A Tale for the Young. Translated from the German of Hoffmann by the translator of "Money and its Influence." (E. Faithful. Pp. 151.)—THE language here is so idiomatic, and flows so easily, that one is scarcely conscious of its being a translation. The story itself is a charming one—full of incident and adventure; and the religious teaching fits in so naturally, and yet so tellingly, at the proper place that a thoughtless boy or girl would at once be aroused to its importance. Herein lies the whole art, as we have repeatedly remarked, of conveying religious instruction in written language. The present tale has our entire approval.

American Finances and Resources. Letter No. 1 of Hon. Robert J. Walker, M.A., Counsellor-at-Law in the Supreme Court of the United States, &c., &c. (Ridgway. Pp. 45).—*Jefferson Davis. Repudiation, Recognition, and Slavery.* Letter No. 2 of Hon. Robert J. Walker, M.A., &c., &c. (Ridgway. Pp. 12.)—THE greater part of the first pamphlet is devoted to the "Appendix," which contains, first, "the Act to provide a National Currency, secured by a pledge of United States Stocks, and to provide for the circulation and redemption thereof;" secondly, by "the Loan Act of 1863," entitled "An Act to provide Ways and Means for the support of the Government." The letter itself treats of Mr. Chase's finance-scheme, for the exposition of which we are indebted chiefly to the financier's own speeches, which Mr. Walker quotes at great length. His own elucidations are few, and constitute a very insignificant portion of the pamphlet. The second pamphlet is a continuation of the one published by Mr. Walker a few weeks back, and which we noticed at the time, treating of the repudiation doctrines said to be advocated by Jefferson Davis some fourteen years ago. Mr. Walker promises to proceed with the subject in a future letter.

Recueil de Monuments Egyptiens, dessinés sur lieux, et publiés sous les auspices de Son Altesse le Vice-Roi d'Egypte, Mohammed Said Pasha. By Heinrich Brugsch. (Leipsic: Hinrichs.)—THIS is the third instalment of this work, and contains plates 51—107, with sixty pages of letter-press. The greatest part of the texts in this portion belongs to Thebes the inexhaustible, and to the sacred Island of Philæ—the first portion having commenced with Memphis. It need hardly be mentioned that only such monuments have been selected as have a more or less distinct bearing upon astronomy, history, mythology, and geography; and with this we have pointed out the paramount importance of the work for the whole literary world. Yet another feature deserves special mention—viz., its handy form and reasonable price, which brings it within the reach of students in their own libraries. It may also be interesting to notice that Passalacqua's famous "Medical Papyrus" has found a place in this collection.

Glück und die Oper. Von A. B. Marx. Two Volumes. (Berlin: Janke.)—THIS is one of the most exhaustive accounts of the great composer, as well of the history of the origin of modern Opera itself. The first of the five books of which the work consists contains the history of Glück's youth, who, born on the 2nd of April, 1714, at Weidenwang, in the Upper Palatine, emigrated in his boyhood to Bohemia, where, in an astonishingly short time, he acquired a mastery over violoncello and violin, piano and organ. The second book shows us the young musician in Italy, where at that time no fewer than forty composers of operas strove to outdo each other, and where Gück naturally found but little encouragement as a rival, and was, indeed, but little heard of. In 1745 he went, as companion of Prince Lobkowitz, through Paris to London. Here he met Handel, who, thirty years older, formed the warmest attachment to his young brother in art, and exercised a great influence upon Glück's studies and subsequent career. The most brilliant period of Glück's life, which began when he was forty-eight years of age, is treated in the third book. In the years which follow, 1760—1773, he sets to work at the real task of his life—viz., the reformation of the Opera. From Vienna he migrated to Paris. To the description of his varied life there, his struggles with the Piccinists, &c., the author devotes the fourth book. The fifth and last contains the master's "Exordium." The name of the distinguished author is in itself a guarantee for the care and accuracy with which he has carried out the task; all we have to add is that the book is not only one of the most precious contributions to musical history, but altogether one of the most attractive and fascinating works we have come across for some time.

Mémoires d'Histoire ancienne et de Philologie. By Emile Egger. (Paris: Durand.)—THIS is the second and final volume of a very valuable collection of archæological, epigraphical, and generally antiquarian essays. We shall briefly indicate the principal papers which this part contains, the name of the author rendering a further recommendation unnecessary:—1. Polemon, the Travelling Archæologist. 2. Public Honours among the Athenians. 3. Critical Investigation of a Passage of Cicero on the Greek Artists. 4. Historical Observations on the Formalities of the Civil Status among the Athenians; with an unedited Inscription on a small Brass Plate, probably of Athens. 5. Did the Greeks know Banking-bills? 6. Greek Texts on a Papyrus (a fragment of an account, a fragment of the Poet Alcman, a fragment of an oration—all three edited for the first time). 7. Critical Notes on several Monuments of Greek and Roman Metrology. 8. The Study of the Latin Language among the Ancient Greeks. 9. Newspapers among the Romans, and the Annals of the Pontifices. 10. Observations on the History of Slavery in Antiquity. 11. On several Documents of Latin Epigraphy. 12. A Greek Inscription from the Serapeum at Memphis. 13. Greek Inscriptions on Ancient Pottery. 14. An unedited Document—as a Contribution towards the History of the Romance Languages. We shall only add that the *fac-similes* of the texts, published here for the first time, are executed with most praiseworthy accuracy and neatness.

Revue Continentale: Sciences Morales, Histoire, Littérature, Beaux-Arts: Paraissant par

trimestre en Février, Mai, Août, et Novembre. Rédigée par un Société de Savants Belges, Français, Allemands, Anglais et Italiens, sous la direction de M. N. Batjin. Tom. III.: Août 1863. (Gand. Pp. 308.)—THIS Belgian periodical is one of superior aims and merit, and seems especially well-affected towards English literature and English social topics. About a third of the present number is taken up with accounts and reports of meetings of societies, including the general meeting of Learned Societies held at Paris in April last, when M. Victor Foucher presided over the Section of History and Philology, the Marquis de La Grange over that of Archæology, and M. Milne-Edwards over that of the Sciences; but there are some ten or twelve independent articles. Among these are—a review of M. Francisque-Michel's important work, "The Scots in France and the French in Scotland;" a criticism of one of Sir Edward Bulwer-Lytton's most recent novels; a review of Wolf's History of Brazilian Literature; a paper on Phonetic Language and the Language of Signs; a notice of Prince Albert's Letters and Speeches; and a brief paper on Mr. Dunning Macleod's views of Political Economy, which, it seems, some French writer has represented as amounting to a revolution in Economic Science.

A Dictionary of Chemistry and the Allied Branches of other Sciences. Founded on that of the late Dr. Ure. By Henry Watts, B.A., F.C.S., &c. (Longman, Green, & Co.)—THIS is the seventh part of the great dictionary of chemistry, the first volume of which has already appeared. We are glad to see as we proceed that no pains are spared in the matter of illustration and diagram where such are necessary. The article on "Crystallography," for instance, occupies some twenty-eight pages, and almost every page has a series of carefully prepared diagrams. The present number reaches from Conhydrine to Cyanic Acid.

Tracts for Parents and Daughters. Tract No. 1: *How shall I educate my Daughter?* Tract No. 2: *Shall my Daughter learn a Business?* (E. Faithful. Pp. 12 each.)—These little tracts are sensibly written, and their publication may be regarded as very opportune. The subject of female education, as respects the middle classes, has long occupied thoughtful minds; and the firm manner in which it is approached and treated in the papers before us will prove as satisfactory to parents as hopeful and consolatory to all right-minded daughters.

Polens Untergang und Wiederherstellung, by O. Agricola (Gotha: Perthes), is the title of another work on Poland and its past, present, and future state. The first principal division treats of the single portions of its constitution, and tries to prove that, out of an anarchical code of this description on the one hand, and the standstill of legislature on the other, besides the growing corruption in the province of administration, which gradually ruined the finances and the army of the country, has grown all the misery of the last two centuries. The delineation of the different "States"—the peasants, the citizens, the nobility, and the clergy of the different periods—vivid, yet not overdrawn, contributes to a better understanding of the times under consideration. The second division speaks of the relations of foreign powers to the sinking country, and shows how the policy of Russian conquest—now directed against Poland, now against Turkey—so well understood the method of using German discord that the great powers of Germany were forced to become accomplices in the division of Poland. Rulhière, Lelewel, Sybel, Hermann, and other historians have been laid under contribution; but, throughout the work, it is quite evident that the author is a man who has looked into the sources himself, and who also thinks for himself. The conclusion at which our author arrives is, however, sad enough. The restoration of a free and independent Poland is, according to him, an entirely hopeless task. It is not our province to enter into a controversy with the author; and, however much we may differ from his opinions, we cannot but recommend this book to all who take a real interest in one of the most "burning" questions of the day.

Handbuch der Witterungskunde. By C. G. Jahn. (Leipsic: Lorck.)—EVERY branch of natural history, the author thinks, has been treated popularly, save one, which perhaps is the most important—meteorology, or the science of the weather, the paramount influence of which upon the life of men, animals, and plants, as well as upon the many affairs of public and private life, is well known to every one. The first book of this work, therefore, which is to fill up this gap, treats of air, its pressure, temperature, and other phenomena; the second of the instruments requisite for their observation and investigation, and how they are used; the third of the weather itself, and of the rules of predicting it, to which are appended the so-called peasants' weather-rhymes. The style is clear and popular; and the book deserves commendation as an elementary manual.

Uber Walther's von der Vogelweide Herkunft und Heimath, by Heinrich Kurz (Aarau: Sauerländer), is the title of a new contribution to the rapidly increasing "Walther-Literature." While Rieger in his recent work holds Walther to be of knightly parentage, and born in Swabia, and Hugo Meyer goes so far as to identify him with "Schenk Walther von Wipfe," the author of the monograph before us endeavours to prove—but with little show of reason, it would appear—that the famous lyrical poet was a native of Switzerland, and was *not* a scion of a noble family.

The New Review for September contains a carefully written political memoir of the late Sir Cresswell Cresswell; a Summary of the Session just closed; and an interesting article on "Central Australia," in which the travels and exploits of such noble fellows as Sturt, Landsborough, Burke, Wills, M'Kinlay, and Stuart are recounted. The article on "Mahomet and his Religion" is written in a calm and discriminating spirit, and will be read with pleasure. The lighter papers are—a very laudatory one on "Thackeray's Roundabout Papers," an instructive one on "The King of Dahomey," who has become quite a lion of late, and a very interesting one entitled "The Dean of St. Patrick's—dramatized," being an account of a French play. "The Stray Thoughts on Coleridge" refer chiefly to his philosophy and teaching. The article is thoughtful, after a somewhat juvenile fashion.

The Eclectic Review has a paper on Renan's "Life of Christ," which does the French *savant* but scant justice. "Ultramontanism and Free Thought" is bolder and more philosophical. "Ulrich von Hutten," a paper on the knightly reformer of the sixteenth century, and the article entitled "The Daughter of Gustavus Adolphus," are very readable. "The Races of Europe" and "A Triad of Muses," which consists of friendly criticisms of the poems of Jean Ingelow, Bessie Rayner Parkes, and Fanny Susan Wyvill, are the other articles. —In *The Rose, the Shamrock, and the Thistle* will be found continuations of "The Life and Adventures of Jacob Morriston;" "Quicksands on Foreign Shores," edited by Archbishop Whately; "Woman in Daily Life; or, Shadows on Every Hill-Side," by Mrs. Harriet M. Carey; and "Roundabout Letters on Stratford-on-Avon," by J. O. Halliwell, F.R.S. In the last-named there is as little originality in the letters themselves as in the title, for one of the anecdotes to which we are treated is an unmistakable Joe Miller. S. F. Williams favours us with a tremendously appreciative criticism of Wordsworth's "Peter Bell;" and Serjeant Burke, in his "Women of Merit connected with Criminal Trials," narrates the pains and penalties suffered by one Edward Floyde for talking lightly of the "Princess Elizabeth, Palsgravine, Duchess of Bavaria, and Queen of Bohemia." The rest of the number is made up of light pleasant reading.—The paper entitled "Atoms," by the author of "The Gravel-Pits at Amiens," in the *Christian Spectator,* is written in a popular vein; the other articles are chiefly of a religious cast.—*The National Magazine,* besides its usual amount of interesting matter, has a carefully engraved frontispiece of a head characteristic of "Tyranny." The type is well realized.—*Young England* is profusely illustrated, and is devoted to the instruction and amusement of "the educated youth of the British Empire."—We have also received two numbers of *The Journal of Health,* in which will be found information chiefly from the homœopathic point of view.

PUBLICATIONS OF THE WEEK.

ARCHBOLD (John Frederick). Poor Law, comprising the whole of the Law of Settlement, Relief, and Removal of the Poor, with Forms. Vol. 3. of the Justice of the Peace. Eleventh Edition. 12mo., pp. xli—924. *Shaw and Sons.* 30s.

ASHWORTH (John). Strange Tales, from Humble Life. Fcap. 8vo., cl. sd., pp. 188. Manchester: *Bremner. Morgan and Chase.* 1s. 6d.

BALLADS OF UHLAND, GOETHE, SCHILLER. With Introductions to each Poem, copious Explanatory Notes, and Biographical Notices. By Charles Bielefeld. (Foreign Classics.) Fcap. 8vo., pp, xii—197. *Bell and Daldy.* 3s. 6d.

BEBBINGTON. Why I was an Atheist, and Why I am now a Christian. By J. B. Bebbington, late Editor of the "Propagandist." Cr. 8vo., sd., pp. 32. *Tresidder.* 3d.

BELL (Catherine D.) Hope Campbell; or, Know Thyself. Fourth Edition. Illustrated. Fcap. 8vo., pp. 331. Edinburgh: *Kennedy. Hamilton.* 3s. 6d.

BORDER AND BASTILE. By the Author of "Guy Livingstone." Second Edition, revised. 8vo., pp. xii—277. *Tinsley.* 10s. 6d.

BOY'S MISCELLANY (The). Vol. 1. 4to. *Harrison.* Sd. 2s. 6d.; cl. 3s. 6d.

BRADDON (M. E.) Eleanor's Victory. Three Volumes. Post 8vo., pp. 947. *Tinsley.* 31s. 6d.

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GRONOW (Capt. R. H.) Recollections and Anecdotes: being a Second Series of Reminiscences of the Camp, the Court, and the Clubs. Second Edition. Cr. 8vo., pp. vii—232. *Smith and Elder.* 7s. 6d.

HOW SHOULD WE TREAT OUR SERVANTS? By M. K.N Fcap. 8vo., pp. 76. *Mozley.* 1s.

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JUST READY.

BRADLEY (W. W., M.A.) Lessons in Latin Prose. 12mo. *Longman.* 5s.

CÆSARIS (C. J.) De Bello Gallico. Lib. 1-5. By A. K. Isbister. 12mo. *Longman.* 3s. 6d.

CIVIL SERVICE (India) Examination Papers. July 1863. Fol. *Stanford.* 2s. 6d.

CROWQUILL (Alfred). Tales for Children. First and Second Series. Imp. 16mo. *Routledge.* Each 2s. 6d.

FIRST STEPS IN DRAWING FOR BEGINNERS. 4to. *Ward and Lock.* 2s. 6d.

HOSKINS (G. A.) Winter in Upper and Lower Egypt. 8vo. *Hurst and Blackett.* 15s.

JACKSON (J., D.D.) Sinfulness of Little Sins. Fifteenth Edition. 18mo. *Skeffington.* 1s.

LAURIE'S ENTERTAINING LIBRARY. Defoe's History of the Plague. 18mo. *Longman.* 1s.

MAGNET STORIES FOR SUMMER DAYS AND WINTER NIGHTS. Vol. 6. Fcap. 8vo. *Groombridge.* 2s. 6d.

WALSH (J. H.) Manly Exercises. 18mo. *Routledge.* 6d.

WALTER (J. Conway.) Genuineness of the Book of Daniel 8vo. *Longman.* 5s.

WOOD (Rev. J. G.) Our Garden Friends and Foes. Post 8vo. *Routledge.* 7s. 6d.

MISCELLANEA.

A WRITER in the August number of the *Revue Continentale*, a quarterly periodical published in Ghent, of size and note sufficient to rank with our quarterlies, makes the following remarks:—"There were published during the year 1862 about 14,000 works in Germany; about 11,500 in France; but in England only 4800. This disproportion between England and France justifies itself to a certain extent in this respect, that in England there are none of those pamphlets and mediocre romances which shoal in France. English works, comparatively and in general, carry it in merit over French works. It is, moreover, incontestable that English literature, despite the attacks of which it has for some time been the object, is making giant strides, and, before long, will have nothing to envy the most favoured nations." There is something in these remarks that must strike people here as odd. We had hardly fancied, for example, that there had been so much malevolence towards our literature abroad as the writer seems to speak of. Nor had we been fully aware of our happy freedom from the pest of pamphlets and silly novels. The writer, however, is perfectly correct in his report of the number of publications in Great Britain for 1862 (unless, indeed, he gives us credit for a little more than we deserve, for *our* estimate makes the total number of publications in Britain for 1862 only 3913, exclusive of parliamentary papers and the daily and weekly press); and, if his statistics of the book-trade in Germany and France are equally correct, our shortcoming of the German and the French rate of book-production is a fact worth being known and thought of. Whether we should be glad or sorry, we leave as a question between Mr. Carlyle and Paternoster Row.

PRINCE FREDERICK OF DENMARK is entered at Christ Church, and will become resident in Oxford at the commencement of the ensuing term. The Rev. Mr. Kitchen of that College has been appointed tutor to the young prince, for the accommodation of whom the residence of Alderman Randall, at Grandpont, has been engaged.

AN appeal is being made by the rector of High Laver, near Ongar, in Essex, for subscriptions to repair the tomb of John Locke. Instead of being made to the public, this appeal should surely, in the first place, be made to the noble descendants of the philosopher's daughter. To contribute till that has been done and failed would be a mark of disrespect to those descendants who, with very proper pride, retain his surname as a Christian name in the family.

THE good people of Stafford have made an appeal to Waltonians to subscribe liberally to a memorial to be erected in his native town to honest Old Izaak, the angler.

THE clergy of Natal have addressed a strong remonstrance to Bishop Colenso.

THE Bishop of Norwich is understood to have instituted proceedings against the Rev. G. Drury, rector of Claydon, Suffolk, for the innovations introduced by him into the celebration of divine service in the parish-church.

THE annual "Spital Sermon" at Christ Church, on St. Matthew's day, the 21st instant, before the Lord Mayor, Aldermen, and Sheriffs, will be preached by the Rev. W. Romanis, of Emmanuel College, Cambridge. The speeches by the senior scholars will afterwards be delivered in the Great Hall of Christ's Hospital.

THE *Wochenchronik* says:—"Messrs. Broadwood and Sons, who, in the forty-six years from 1780 to 1826, manufactured 48,348 pianos, during the subsequent thirty-five years, to 1861, sent forth the astounding number of 75,700 new instruments. In London alone 23,000 pianos are annually manufactured."

THE Rev. Robert Chapman Whiting, M.A. of Trinity College, Cambridge, has been appointed to the sub-wardenship of St. Peter's College, Radley.

A WRITER in *Notes and Queries* quotes a document given in Russell's "History of Guildford," published in 1801, to show that the word "cricket," as the name of our national game, is much older than is usually supposed, Strutt, in his "Sports and Pastimes," placing it at the commencement of the eighteenth century. The word occurs in an affidavit respecting a "Garden withelde from the Towne," anno 40 Elizabeth, in which "John Derrick, gent., one of the Queen's Majestie's coroners for the county of Surrie, saith: 'When he was a schollar in the free-school of Guldeforde, he and several of his fellowes did runne and play there at *crickett* and other plaies.'"

Here is an advertisement which appeared in last week's *English Churchman*, and which shows how cheap clergymen who cannot write their own sermons may buy ready-made ones in these days. We give all save the name and address of the sermon-seller:—"*Original Plain Practical Sermons:* The circulation of this Lithographic Periodical is exclusively confined to the Clergy. Terms to subscribers:—A Quarter's Sermons—viz., Thirteen Sermons—13s. 6d.; other Sermons charged for according to the subject. No second copy of a Sermon will be sent within reach of another Subscriber. For further particulars apply by letter, giving name and address, which will be received in confidence, to ——, Bloomsbury, London." A shilling a-piece seems cheap, indeed, for sermons. But what is meant by "other sermons charged according to subject"? Are there guinea-subjects and two-guinea subjects in theology, according to toughness? And then, oh! the horror, if by any means several copies of the Lithographic Periodical were to get into the same district or parish!

"PHIZ" has just ready a companion to his recent "How Pippins enjoyed a Day with the Fox-Hounds"—to wit, "How Pippins enjoyed a Day with the Stag-Hounds"—the same size as the former, twelve plates, quarter double elephant, also to be published at one guinea.

THOSE who read and admired "My Good-for-Nothing Brother," and wondered at the power of writing possessed by the authoress, "Wickliffe Lane," will hear with real sorrow of the death of this young and gifted woman. We understand that the MS. of a novel which was finished only a week before her decease is to be placed in the hands of a publisher.

MESSRS. DALTON AND LUCY announce a volume of sermons by the late Rev. H. Hutton, Rector of St. Paul's, Covent Garden, including the last six discourses delivered by him in that church, to which will be prefixed a biographical memoir of the author, by the Rev. Canon Dale.

MR. FREEMAN has just ready a very curious volume, edited by the author of "Dives and Lazarus," entitled "Shirley Hall Asylum; or, the Memoirs of a Monomaniac."

BARNES'S "Notes on St. Matthew" have been translated into Chinese by a native Christian at Hong-Kong.

THE *Sewing-Machine* is the title of a new periodical devoted to "the benefit of the trade it represents."

SPIRITUALISM is getting daily more and more rampant in America. The last month produced at Boston, U.S., a crown octavo volume under the title of "The Soul of Things; or, Psychometric Researches," by William and Elizabeth Denton. The biologist prodigy who, some years ago, read a Greek book without its being opened, or knowing one word of Greek, merely by having it placed on his stomach, sinks into a very every-day affair compared with the lady just mentioned. Place in her hand the merest fragment of rock or fossil, so that she may press it to her forehead, and forthwith you have the history of the place from whence it came, a lively description of its people, its scenery, and natural productions, even though it should carry you far beyond those races which Dr. Chwolson and the "Book of Nabathæan Agriculture" place thousands of years before Adam. Whether Mr. and Mrs. Denton exist in the flesh we know not; and whether, if they are living and breathing, they are "serious or joking," is no less a mystery. At all events, Messrs. Houlston and Wright are about to give us a London edition of the book: so probably William and Elizabeth Denton are not the mere myths of a publishing firm that one is apt to imagine them after perusing their "Psychometric Researches." In August, too, were published at Boston, U.S., Uriah Clark's "Plain Guide to Spiritualism: a Handbook for Sceptics, Inquirers, &c., &c.," and the second volume of Hudson Tuttle's "Arcana of Nature; or, the Philosophy of Spiritual Existence."

A PASSAGE in the speech with which the Minister of Public Instruction—Duruy—accompanied the distribution of prizes in the Sorbonne this year is so characteristic that we shall quote it in full. After having made the announcement that henceforth Modern History up to the present day was to form part of the instruction, the minister continued: "Our pupils are well acquainted with the history of Sparta, Athens, Rome, and the Middle Ages. But they do not know the state of that modern society of which they are to become active members. Through their studies they are the contemporaries of Pericles, Augustus, and Louis XIV., but not of Napoleon III. Hence so much ignorance of things in the midst of which they are to live—so much error, deception—so many people who belong neither to their time nor to their country. We have a classical education, and this is well; but we have no national education, and this is bad. The Emperor wishes this to be altered. A happy fate has granted to me, that I stand in near relation to the one upon whom the wishes of the world are directed, and who of all princes loves your studies best and knows most of them. Believe that from a man who has never yet flattered anyone. You are the France of the future, and you may bear high your heads and your hope: for he who holds the destiny of our country in his mighty hands has a great heart and a noble understanding. The really most liberal man of the Empire is the Emperor." It must not be omitted at the same time that, in the further course of his speech, the Minister called France "*The Moral Centre of the World.*"

OWING to the manifold ghosts and spectres now stalking about on the boards of the Paris Theatres, people there no longer call them the "Spectacles," but the "*Spectracles.*"

AN International Exhibition of Agricultural and Industrial Products, with which will be associated an Exhibition of Art Products, will be held in Paris from May 1st to September 30th, 1867.

THE lengthy pamphlet against Renan by the Bishop of Nîmes has been followed by a much shorter document from the pen of Desprez, Archbishop of Toulouse. The latter does not stoop to

examine the arguments brought forward in the "Vie de Jésus," but briefly and summarily exhorts his flock to disavow "the attempt made against God—an attempt such as has not been seen since the day when the philosopher of Ferney cried "*Ecrasons l'infâme!*" &c. The other bishops and archbishops are to follow with anti-Renan pamphlets, books, and pastoral letters. One of the most characteristic replies to the book appeared the other day, the author of which chiefly denounces Renan as "anti-Napoleonic," since in the writings of Napoleon I. another view is taken of Christ. Of other writings occasioned by the book may be mentioned an "Étude," now preparing, from the pen of M. Ste.-Beuve. It is said that he has only very reluctantly yielded to the pressing solicitations of his friends in appearing on a field comparatively foreign to him. His critique is to appear in the feuilleton of the *Constitutionnel*.

IT is calculated that 700,000 people had flocked to Paris for the late Fête de l'Empereur, and every one of them was in ecstasies of delight; so, at least, the Parisians declare. There was, however one little song in the Opéra Comique, called "Après la Victoire," which, by its singular metre, is said to have been highly displeasing to some people's ears, and which it was also contemplated to suppress. The following stanza may serve as a specimen:—

Formez les choeurs . . et que l'on *danse*,
Mêlez vos refrains,
Clairons, tambourins!
Ran, plan! plan! ta, ta, ta!
Allons en cadence,
Fêtons l'abondance;
Chantons et dansons
Au bruit des canons!

WE notice two new philosophical pamphlets by F. Bonifas—"Étude sur la Theodicée de Leibnitz" and "De Petrarchâ Philosopho."

THERE has been a curious reprint of an old French hymn, entitled "Cantique faict à l'honnevr de Dievr par Henry de Bovrbon IIII. de ce nom, tres chrestien Roy de France et de Nauarre, après la bataille obtenve sur les Ligvevrs en la Plaine d'Jury, le 14 de mars, 1591. Nouuellement imprimé à Lyon par Louis Perrin."

A CONTRIBUTION to ecclesiastical history—"Ces bons Messieurs de Saint-Vincent de Paul, par J. M. Cayla"—is much spoken of.

"LA Bretagne du V^{e} au XVII$_{e}$ Siècle," by Aurelien de Courson, librarian at the Louvre, is the title of a recent work of which one hundred copies only have been printed and fifty alone have been offered for sale.

MESSRS. WEIDMANN of Leipzig will publish during the autumn the first half of the second volume of Mætzner's English Grammar, containing Syntax; the first half of the second volume of Leo Meyer's "Vergleichende Grammatik der Griechischen und Lateinischen Sprache;" and the second part of the second volume of Classen's edition of Thucydides.

MR. MEISSNER of Hamburg has just ready the third volume of "Isis, der Mensch und die Welt." Volumes I. and II. treat of creeds and religions. This third volume is devoted to the relative duties: of husband and wife, of man as a member of society or subject of a state, of friendship, &c., and of other duties in connexion with the various relations of life.

ACCORDING to the *Journal de Genève*, Zschokke was not sole author of "Die Stunden der Andacht;" but the work was the joint production of some seven or eight contributors, of whom the late M. von Wessenberg was one.

THE Faust-literature has received a new addition in a recent French work by P. Ristelhuber, "Faust in History and in Legend: an Essay on the Superstitious Humanism of the Sixteenth Century, and the Tales of the Diabolical Bond."

BY way of supplement to his edition of Homer, published at Bonn in 1858, Professor Immanuel Bekker has collected into one volume octavo, of 330 pages, all his criticisms and remarks on Homer, and on the labours of other editors, which have appeared in German from his pen in the various literary journals of Germany from 1806 to 1862. On opening the book a startling novelty meets the eye in the preface. German nouns, which usually commence with capital letters, are here printed after the fashion of Latin, French, and English, with lower case or small letters at the beginning. This is a novelty which deserves to be recorded.

"Goethii Elegiæ Romanæ. In Latinum convertit Henr. Stadelmann"—one of the most elegant versions of modern poetry—appeared at Memmingen a few weeks ago.

THE private Court-Theatre in the Castle of Schönbrunn, founded by Maria Theresa, and once famed far and wide, but not used since the days of the great empress, is about to be restored again to its former splendour; and not only the members of the Vienna Court-Theatre, but even the grand personages of the Court themselves, will appear occasionally on its boards.

A SMALL work by C. G. Carus, just published, is entitled "Goethe and his Importance for our Generation and those to come: together with fifteen hitherto unknown parables of Goethe, dating from the year 1770."

THE Austrian Alpine Club have issued their first publication, under the title: "Mittheilungen des oesterreichischen Alpen-Vereines. Redigirt von Edm. von Mojsisovics und Paul Grohmann." Of the eleven larger papers contained in the volume the greater part treat of mostly unknown parts in the Austrian Alps. A new route up the Gross-Glockner by way of Kals, indicated in one of the papers, will be interesting to many. Several additions—such as a guide to the chief summits of the Austrian Alps, a chapter on maps and travellers' books, equipment on Alpine tours, and an extensive Alpine literature—render the little work still more valuable and interesting to a large circle of readers.

THE number of gymnasts present at the late "Turner-Fest" at Leipsic exceeded 25,000, with more than 600 flags.

A NEW street in Frankfort-on-the-Maine has received the name of Sömmering Street, from Samuel Thomas von Sömmering, born 1755 at Thorn, and, after 1805, Member of the Academy at Munich, where he exclusively devoted his time to anatomical and physiological studies, and died 1830. He left a diary, from which his son, Court-Councillor Dr. W. Sömmering, now endeavours to prove the electric telegraph to be "a German invention"—more especially the invention of S. Th. Sömmering. On the 28th of August, 1809, Sömmering, it is said, read a paper before the Academy of Munich, in which he developed the theory of his invention; and in 1811 he handed over to the States-Councillor Baron Schilling von Caustall a complete apparatus, which the latter took to St. Petersburg, and with which experiments were made before the Emperor Alexander.

THERE is to be an International Exhibition of Arts and Manufactures at Vienna in 1866; and the Chevalier von Schauffer, the Austrian Consul in London, and Councillor Parmentier attended a special meeting of the "Newcastle and Gateshead Chamber of Commerce" on the 5th instant to arrange with the manufacturers of the North to become exhibitors.

THE International Statistical Congress was opened at Berlin on Sunday last, the 6th instant, at twelve o'clock, by the Minister of the Interior, who delivered a short address. The proceedings took place in the Chamber of Peers. There were 283 members present.

A BOTANICAL as well as an archæological curiosity is seen now at Hildesheim in Germany. Ancient legends connect, if not the foundation of this city, at least the foundation of its see by the Emperor Louis the Pious, the son of Charles the Great, with a certain wild rose-tree, which is supposed to have stood in its present place on the cemetry of the Dome long before even those days. Although documentary evidence as to its existence in Charles the Great's time is wanting, it is yet distinctly mentioned in a document of Bishop Hezilo, who in 1078 carried a fence around it. There is no doubt whatever that it is the oldest rose-tree in Europe; and for centuries it has attracted the attention of naturalists in a high degree. But the most extraordinary circumstance is this, that two new shoots have come out of the root in the course of this summer, the one of which has already reached a height of twelve feet, and at its diameter measures no less than an inch near the root.

MR. MAVERHOFER, in Vienna, the inventor of various electro-magnetic apparatuses, has lately laid before the committee of the Austrian parliament a new "voting-machine." Every member has two buttons before his seat—one black (No), the other white (Yes)—which, by being slightly touched, produce a corresponding ball on two tables (white and black) at each side of the Speaker, visible both to him and to the whole House. One glance is thus sufficient to show at once to the Speaker, as well as to every member in every part of the House, whether the Ayes or the Noes have it. We hear that the committee have reported favourably upon the invention, and that there is every likelihood of its soon superseding the old-fashioned and most inconvenient system of counting.

ARCHÆOLOGY also, like everything else, has its fashions. The latest stage of mediæval investigation on the Continent directs its attention to ancient ecclesiastical implements and dresses, and the magnificent joiners', silversmiths', embroiderers', weavers' works which have survived. Of recent publications in this province we notice "The Church-Treasure of the Basle-Münster," by C. Buckhardt and C. Riggenbach, which contains, with accurate historical and archæological illustrations, beautiful photographs and woodcuts. Although the principal treasures of Basle, such as the famous altar-piece of Henry II. and the golden rose, are no longer there, enough yet remains worthy of the highest attention and careful study. Another work of this kind is M. Nohl's and R. Bogler's "Chorstühle im Capitelsaale des Domes zu Mainz," in twenty-two large folio-sheets of accurate and excellent drawings, with an archæological introduction. There is also a further instalment of Egle's "Mediæval Architectural Monuments of Suabia," containing the beginning of the plastic and architectonic treasures of Ulm.

Two magnificent edifices are in the course of erection at Pesth—a "Hungarian Academy of Sciences" and a "Hungarian Museum," which will contain the Esterhazy-Collections. Schlüter of Berlin is the architect.

DURING the month of July 658 tickets of admission were sold to visitors to the excavations at Pompeii.

NEW discoveries are reported from Pompeii. A house has been uncovered, which, to judge from the splendour of its interior, and its almost entirely preserved furniture, must have belonged to a very wealthy proprieter. The triclinium (dining-room) is paved with mosaic, representing a number of *gourmandises* of the time. The completely served table is covered with petrified remnants of dishes; and around it are found three divans, or rather table-beds, of bronze, richly adorned with gold and silver, upon which reposed several skeletons. A great many precious jewels were found near them. On the table stood, among other ornaments, a very beautifully worked statue of Bacchus in silver, with eyes of enamel, a collar of jewels, and precious armlets.

THE Pope has just presented to the Museum of the Capitole a colossal statue of the Empress Faustina, from the time of the Antonines, recently found at the villa Massino, which has been acquired by the new railway company. The statue is of extreme elegance and beauty, and has, besides, preserved all the gilding and colouring. It has now been placed in the "Gladiator-room."

THE fourteenth and fifteenth volumes of Brockhaus's "Colleccion de Autores Españoles" contain the works of Juan Eugenio Harzenbusch, edited by the author himself.

THERE is announced the death of the Commendatore La Farina, the friend of Cavour, and founder of the National Society at Turin, whose object was the consolidation and liberation of Italy—an object which he also greatly forwarded by the publication of a journal, printed on such thin paper that it could easily be smuggled into the absolutist states. It was known as the *Little Courier*. Farina expired on Saturday last at the early age of forty-eight. He was born at Messina in 1815, and entered public life through literature. In 1848 he took a conspicuous part in the Sicilian revolution, and, on its failure, he first settled in France, and then at Turin. This session he was elected Vice-President of the Chamber of Deputies. His funeral on Sunday was a public one, a deputation of the deputies taking part in the ceremony.

CORRESPONDENCE.

(Anonymous Communications cannot be inserted.)

FINAL CAUSES.

To the Editor of THE READER.

SIR,—In an article in your number for August 29th, I find the following passage:—

> The author points out very satisfactorily the weakness of the old argument from final causes. We fix a peg in the wall to hang up our coats, because without some contrivance of this sort the pull of the earth would bring them to the ground. But, suppose the pull of the earth and the strength of the peg were the result directly of our will, where would be the *design* shown in the use of the peg? It would pass into a mere play of the will itself. No one can perceive the force of this reasoning more clearly than Paley himself, who, in the work to which this objection is fatal, expresses it with his peculiar terseness and perspicuity. "Contrivance," says he, "is, by its very definition and nature, the result of imperfection."

Now, it appears to me that, instead of clearness, there is not a little confusion of thought in this admission of Paley's—"Contrivance is the result of imperfection." What Paley probably meant was, that contrivance implies imperfection. But

where? Not in the designer, but in the product. And, then, in what sense? Not necessarily in any other sense than that of limitation. But that, from the very nature of the case. Infinity excludes contrivance, and is, of course, perfect; because, by its predicated nature, it is impossible in any way to add to it. But the creation of an infinite may be safely pronounced impossible. No created object is, or can be, perfect in the sense which would exclude room for the exercise of design. For, every created (or finite) object might have been different from what it is. As to material objects (so called), our senses tell that each is different from every other. None, therefore, is perfect in the sense which would exclude design, for we can conceive that each might have been different from what it is. And *why* is it what it is, and not other? So of minds. Assume the highest in power, susceptibility, and knowledge, and still there might be a higher, so long as you are short of the infinite. Here there is all but boundless scope for the exercise of WILL. But there is equal scope for the exercise of DESIGN. And more, there is commensurate necessity. What would mere will effect, apart from what we intend by contrivance?—would it ever produce a system? We might have fortuitous atoms (or bodies) and isolated intelligences (perhaps); but there an end. There could be no advance. Uniform sequence, orderly progress, testify to design; and we have evidence of it in every link of established (as contradistinguished from necessary) connexion between cause and effect. The Infinite excludes the ideas of Design and Imperfection; but the Finite involves both. The Finite, from its predicated nature, must ever be short of the absolutely perfect. But, in what it is now, as well as in its antecedents and its tendencies—in its whence-from and its whither-ward—it manifests Design no less than Will.

W. M'C.

Aberdeen, Sept. 5th, 1863.

ZADKIELISM.

To the Editor of THE READER.

SIR,—I have just perused your candid and elaborate review of my recently published book—"Curiosities of Occult Literature"—and I desire to observe, for the information of persons who may read the former without reading the latter, that although, as you truly observed, Lord Brougham declined to act as "Patron" to the scheme for the Public Telescope in the year 1853, his Lordship decidedly "highly approved of the plan," unless his note to me of 6th January, 1853, was a forgery, which is not probable. Lieutenant Morrison appears to have attributed far more weight to this "approval" than it deserved, or than its author intended it should convey; and certainly until the subsequent month of June I had no reason to believe that the plan was "still-born."

Sir E. B. Lytton's note was more curt than courteous; but he did not hold out a false or unsteady light; and it is better to have a warm enemy than a cold friend, in my opinion.

Yours obediently,

CHR. COOKE.

Chatham Place, E.C., 8 Sept., 1863.

SCIENCE.

THE BRITISH ASSOCIATION AT NEWCASTLE.

HOW much is there that we would fain here record did not the three hundred and odd papers which have to be chronicled reduce our space to a *minimum!*

Let us firstly congratulate the British Association on the Newcastle meeting, seeing that no less than 3356 registered members and associates were present, and contributed the sum of £3600 to the advancement of science—a sum we know will be well laid out, and of which, as we stated last week, £1715 has already been appropriated.

The following were the papers recommended at the concluding meeting of the General Committee to be printed *in extenso*:—

Piazzi Smyth "On the Newcastle Time-Gun."
Siemens "On the Electrification of Gutta Percha."
Akin "On the Transmutation of Spectral Rays."
Bell "On the Metallurgy of the District."
Richardson "On the Chemical Manufactures, Northern District."
Allman "On *Hydroida*."
Airy "On Steam-Boiler Explosions."
Palmer "On Iron-Ship Building on the Tyne."
Dr. E. Smith "Abstract of his Report on the Nature, Growth, and Preparation of the various Elementary Articles consumed as Food by the district population of Bengal and others."
Presidents' Addresses (B. and E.)

We learn also that the value of the next yearly volume will be increased by references, showing where the papers of which abstracts only are given have been published in greater length, or *in extenso*, a fact which again requires us to call attention to the admirable efforts of the Newcastle press—the *Daily Chronicle* especially—to record the papers and general proceedings. Bath must here, as in other things, keep up to the Newcastle standard.

The following recommendations, not involving money-grants, were also made:—

That Mr. Fleeming Jenkin be requested to continue his report on Thermo-Electrical Phenomena.

That the committee on Fog-Signals be reappointed.

That Professor Foster be requested to continue his report on Organic Chemistry.

That Dr. J. E. Gray, Dr. Sclater, A. Newton, and A. R. Wallace be appointed a committee for the purpose of investigating the subject of the Geographical Distribution of Domestic Ani mals.

That S. Gregson, Esq., M.P., Dr. Neilson Hancock, James Heywood, Esq., W. Tite, Esq., M.P., Thomas Wilson, Esq., with power to add to their number, be a committee for the purpose of considering and reporting on the subject of Agricultural Statistics.

That Mr. Francis Galton be requested to report on Systems of Weights and Measures, other than purely decimal, suitable for general adoption.

That Professor Rankine, Sir W. Armstrong, Lord Wrottesley, Sir John Herschel, the Astronomer-Royal, General Sabine, Dr. Lee, the Rev. Dr. Robinson, W. Tite, Esq., M.P., Colonel Sykes, M.P., Sir John Hay, Bart., M.P., the Right Hon. C. B. Adderley, M.P., W. Ewart, Esq., M.P., James Heywood, Esq., Professor Williamson, Professor Miller, and F. Purdy, Esq., (as Secretary), with power to add to their number, be a committee to prepare and report on the best means of providing for a Uniformity of Weights and Measures with reference to the interests of science.

That the committee on Scientific Evidence in Courts of Law be re-appointed, and that Dr. Miller, Professor Williamson, and Sir B. C. Brodie, Bart, be added to the committee.

That the President of the Association be requested to transmit the thanks of the Association to the English and Austrian Governments for the facilities they have afforded for the investigation into the properties and applications of gun-cotton, contained in the report of the Committee.

It was also decided to draw the attention of the Government to the importance of a full and searching inquiry, conducted by a Royal Commission, into the various practical applications connected with the public service for which gun-cotton may be suitable; and with this view the Assistant General Secretary was requested to cause the report, with its accompanying documents, to be printed, and copies to be presented, accompanied by the resolution, to the Secretary of State for War.

Thus much for the remainder of the formal business. Nor must we forget to give the names of the foreigners who honoured the Association at Newcastle by their presence. Need we say with what delight Section A. heard Professor Plücker discourse on Spectrum Analysis, or how Professor Sainte-Claire Deville was welcomed by the chemists. Among the others present were the following:—H. De Jaer Liplon d'Anvers; Dr. Th. van Däesburgh, Rotterdam; A. Vanvert de Mean; Baron Donald Mackay, Secretary to the Dutch Legation; Professor Adolph Steen, Copenhagen; Dr. C. K. Akin; Mutre Coomàra Swàmy, Member of H.M. Legislative Council of Ceylon; M. L'Abbé Moigno, Paris; Ch. V. Zenger, Prague; MM. L. De Mauyrea and L. Kessler; l'Ingénieur Gaëtan Bonelli, Milan; C. H. D. Ballot, Superintendent of the Royal Meteorological Institute of the Netherlands; The Chevalier de Paracentior, Vienna; The Chevalier de Schaeffer, Austrian Consul; Dr. Tunod, Paris; Dr. Nitz, Nordenskiöld, Conseiller d'État, Finland.

We are compelled to give but a rapid account of the Excursions, although they formed such an important feature in the week's proceedings, and evidenced, in such a marked degree, the hospitality of the men and resources of the soil of the North Country.

The manufacture of aluminium was one of the objects of interest on Saturday, when the Mayor of Newcastle, J. L. Bell, Esq., conducted a party, composed almost exclusively of members of the Chemical Section, through his works at Washington, the only establishment in England where the manufacture of metallic aluminium is as yet carried on.

Our readers are probably aware that aluminium exists to a large extent in clay and in many of the commonest minerals. It is not, therefore, from any scarcity of ores, but on account of the difficulty of obtaining it in the metallic state, that aluminium was practically an unknown substance ten or twelve years ago, and is comparatively rare even now.

When the manufacture of this metal was begun at the Washington works three and a half years ago, the substance from which it was extracted was the common ammonia—alum of commerce—which, when strongly heated, yields nearly pure alumina, or oxide of aluminium, mixed, however, with small traces of iron, silica, and phosphoric acid. These impurities, though only present in very small quantity, are not separated in any of the subsequent operations, and, finding their way into the aluminium, deteriorate it to a very great extent. It therefore became desirable to find a material in which these injurious substances either did not exist at all, or existed in such a state that they could be completely got rid of. Such a material was found in *Bauxite*, a mineral consisting mainly of alumina and peroxide of iron, which occurs near Rouen, and is the ore of aluminium now exclusively employed both here and in France.

In order to extract aluminium from bauxite, the mineral is ground, mixed with carbonate of soda, and heated in a furnace. The effect of this operation is to convert the alumina into soluble aluminate of soda, while the iron and other constituents all remain insoluble, so that on treating the product with water a solution of almost absolutely pure aluminate of soda is obtained. From this solution the alumina is separated by the addition of hydrochloric acid, or still better of carbonic acid (whereby the soda contained in the aluminate of soda is again converted into carbonate), and, after being washed, is mixed with powdered charcoal and common salt, so as to form a stiff paste, which is then made into balls of about the size of a cricket-ball and carefully dried. These balls of alumina, salt, and charcoal are next placed in a furnace, where they are heated to a high red-heat, while a stream of chlorine gas is passed over them. Under these circumstances the oxygen contained in the alumina unites with the charcoal, forming carbonic-oxide gas, which escapes by the chimney, and the aluminium combines with chlorine, forming chloride of aluminium, which distils, together with part of the common salt, wherewith it condenses in an earthenware vessel placed to receive it, to a yellowish mass consisting of the double chloride of aluminium and sodium. Finally, this product is intimately mixed with fragments of metallic sodium and the mineral cryolite (a double fluoride of aluminium and sodium obtained from Greenland), which latter acts as a flux, rendering the mixture more fusible, and the whole is shovelled into a furnace and strongly heated. The sodium now combines with the chlorine contained in the chloride of aluminium, and the aluminium, at last liberated entirely from combination with other elements, assumes the metallic state, and, on tapping the furnace, can be run out into moulds prepared to receive it.

One of the most difficult of the many processes that have to be gone through in order to obtain metallic aluminium is the preparation of the dry chloride of aluminium. This substance cannot be made in the same way as most other metallic chlorides—namely, by dissolving the corresponding oxide in an aqueous solution of hydrochloric acid and then getting rid of the water by evaporation, for such a process applied to alumina would yield nothing but alumina again. But, when alumina at a high temperature is in contact with charcoal and chlorine at the same time, as in the process by which chloride of aluminium is actually prepared, the attraction of the charcoal for the oxygen of the alumina and of the chlorine for its aluminium tend each of them to pull the oxygen and the aluminium away from each other, and thus to enable the latter to unite with the chlorine.

From the great fluidity of aluminium when melted, and the consequent ease with which it forces its way into the recesses of a complicated mould, it is admirably adapted as a material for ornamental castings. These, when frosted by immersion in caustic soda, and subsequently in hydrofluoric and phosphoric acids, have a very beautiful silvery colour, which they long retain, owing to the very small tendency of aluminium to unite with sulphur. It is, however, chiefly as an ingredient of the so-called aluminium-bronze, an alloy of ninety parts copper with ten of aluminium,

that the latter metal appears likely to become of most importance. This alloy, when polished, resembles gold to a very remarkable degree, so that it has come already into use as the material of a great variety of articles of utility and ornament. Its tenacity, also, after being hammered, appears to surpass that of almost any other metal or alloy yet known, a property which is of itself sufficient to give to it a very great and real value.

In the excursion to Cannobie, under the guidance of Warrington Smyth, Esq., F.R.S., many features of great geological interest were noticed. Besides the coal-field, the main point was to observe in the cutting a considerable development of ancient slaty rocks, probably Silurian, much broken and contorted, and overlaid quite unconformably by rough conglomerate beds of the old Red Sandstone. These, and the hills of greenstone or basalt which were pointed out to the excursionists, showed very plainly the unsatisfactory state of the geological maps of the district. The coal-fields of Plasketts in the carboniferous limestone, consisting of several workable seams in the upper division of that formation, were also a feature; but the excursionists merely passed across the coal-field, the time not permitting a detailed examination.

On the same day (Saturday) another large party visited the Jarrow Chemical Company's Works at the invitation of Messrs. Stevenson. The laboratory was first inspected, and gave evidence, by the neatness and excellence of the arrangements, that the operations on a large scale are not left to the rule of thumb, but are carefully checked by accurate chemical determinations. The manufactures of the Jarrow Company are alkali, soda crystals, caustic soda, and bicarbonate of soda, to which a new description of antichlor, the hyposulphite of lime, is being added. Sulphuric acid, the main agent in obtaining alkali, is obtained by the burning of pyrites in kilns, and the condensation of the resulting sulphurous acid gas, by the aid of nitric acid and steam in large leaden chambers, into liquid sulphuric acid. The acid chambers at these works are arranged on a principle by which the whole of the acid is drawn off at a sufficient strength for use, the usual concentration being thereby avoided. The various descriptions of pyrites used were shown, and specimens from Spain, Norway, Belgium, and Germany were distributed among the visitors. The decomposing furnaces were next shown, in which the sulphuric acid is made to decompose salt. sulphate of soda and muriatic acid being produced. The great object of the day now came in view—the revolving black ash furnaces. These furnaces, which were introduced some years since, but found to be unmanageable, have, by the attention of Mr. Stevenson to the peculiar differences between the conditions of the charge as worked in the new furnace and in the old, been made to give results far better than can be attained by the use of manual labour, a large saving in labour and wear and tear resulting. The sight of the huge drum rolling over and over, with a charge of some ten times the usual weight, was one which was not easily to be forgotten, and was certainly the most striking of all the operations in the Newcastle alkali works. The charge was drawn, in presence of the visitors, into a train of trucks on a railroad, and taken off to be lixiviated. The whiteness of the alkali and the brilliancy of the crystals were much admired, also the purity and strength of the caustic soda; but the close inspection of this was attended with too much risk to allow of a very near approach to the pans. After partaking of luncheon provided by their hosts, the party were taken on board the *Volunteer* steamer—belonging to the works, and usually employed in carrying waste to sea—and were landed at the copper works of the Jarrow Company, which are under the special superintendence of Mr. A. Stevenson. The residues from the pyrites burners are here smelted, and the copper obtained in ingots and tiles. Here the visit would have ended, but, to lose no chance of showing objects of interest, Mr. Stevenson continued the voyage down the Tyne to show a new steam-dredging machine. This, the largest in the world, was inspected and much admired on account of the massiveness of its construction united with ease and smoothness in doing its work.

A numerous party went to Jarrow again on Tuesday, to inspect the shipbuiling-yard of Messrs. Palmer, one of the most complete in the kingdom; here over 300 sat down to dinner.

On Wednesday the gun-experiments at Whitley Links were well attended, Mr. Fawcus, the Mayor of Tynemouth, and Mr. Palmer sumptuously entertaining those members of the Association who did not at once return to Newcastle.

The excursion of Thursday, and indeed *the* excursion, was the one to Allenheads, whither 220 went by rail and road to inspect the lead mines, with their hydraulic machinery, and objects of interest in the neighhourhood, and partake of the hospitality of Mr. W. B. and Lady Beaumont.

"Here, the ore, preparatory to smelting, is picked, broken, and washed; then roasted in a mild quiet way, that would not hurt a martyr, in furnaces at a moderate heat, so as to allow of the oxygen being absorbed. Half the ore is converted into sulphate of lead, and this in a second operation is mixed with a portion of the unaltered ore, and rendered molten at a higher temperature. The temperature is aided by blast, in some cases by air merely; but the variation in the mode, as well as the appearance of the ore afterwards, depends upon the nature of the ore—some kind requiring one plan, some another. The red lead furnace is very beautiful. It reverberates, and the rich deep colour of the heated ore, and the dancing, curling, graceful, lingering flames, which play over it, make a scene so enchanting that you expect to see little metallic fairies come out and dance in the foreground. The subtle and evasive fumes of the lead are checked, intercepted, and condensed by a variety of ingenious contrivances. Lead would go off all into fume; and in the old time a great deal of it did escape in this way up the open chimneys used. Now they make the chimneys from two to three miles in length—these chimneys or flues running up the mountain sides, and terminating in an upright chimney, two or three miles away. Once a year, or oftener, these flues are swept, when the leaden soot is found to be worth £5000 or £6000. Formerly the noxious fumes poisoned the neighbourhood, burnt up the heather, destroyed the vegetation, and rendered it impossible for a beast to graze, or a bird to feed near the spot. The heather now grows in luxuriance close to the works, sheep graze within a stone's throw of the chimney shaft, and game seek cover on all sides. The grey slag, more resplendent than the brown, is treated under hooded furnaces, so constructed as to carry up the fumes from the room. A fierce little fire burns in a box in which the slag is thrown, and when it is molten it trickles through small bars and runs down a species of fluted girdiron. The smelters stand over the girdiron engaged upon their leaden cutlets, like cutlet cooks. The lead runs into an iron receiver. In another room a series of iron pots, containing several tons of lead, are set out with a separate fire beneath each, on the plan of Mr. Hugh Lee Pattinson. This observer noted that, if fused argentiferous lead be briskly agitated during its slow cooling, a portion of the metal solidifies in the form of crystalline grains which subside. These crystals consist of lead nearly free from silver, the fusing point of the argentiferous alloy being lower than that of pure lead. Or, in less scientific terms, by a simple natural law, melted lead crystallises, while silver remains fluid. A series of manipulations of the lead takes place from pot to pot, in which the separation of these crystals is effected, until in the last pot a residue of lead may be left containing silver in the proportion of 300 ounces to the ton."

Space fails us; and we can but glance at those who, in Falstaffian attire and broad-brimmed hat, with clay candlestick in hand, went to explore the underground wonders of the honeycombed limestone rock of Allenheads, and also at the other parties who visited the weird caverns, magnesian and flexible limestone, of Marsden Rock, Middlesboro', and the mighty enginry of Cleaveland.

We now proceed to report Professor Williamson's admirable Lecture, and to give an instalment of the Sectional Papers, premising that we have not considered it necessary to follow the order in which they were read, the more so as some promised abstracts have not yet been received.

J. N. L.

PROFESSOR WILLIAMSON'S LECTURE ON THE GALVANIC BATTERY

Considered in Connexion with Dynamics.

In the title given to this evening's discourse, I have used a hard word—Dynamics—which suggests the study of active forces, and of calculations about those forces. I thought it was no more than fair to put such a hard word into the title of the discourse, because the title was intended as some sort of description of the thing itself; and there is no doubt that the matter which I have to bring under your consideration to-night requires for its appreciation some of that careful and sustained attention which is given to mathematical subjects. The conclusion, of which it will be my endeavour to convince you, depends on a chain of facts. Each link of the chain is a very simple fact; but yet, if we lose one of them, the chain is broken, and the conclusion falls to the ground. Having given you this warning of a very dry discourse, I am bound to state, in mitigation, that, of actual calculations, we shall only need addition and subtraction.

I have on this table a couple of stout copper wires, one of which is in contact with one pole of a Grove's battery of 100 cells, whilst the other wire is in contact with the other pole. They are very quiet, commonplace-looking copper wires, though capable of giving signs of their pent-up energies; and, if I were to disconnect them from the poles of the battery, they would be found just like any other copper wires; but, whilst in contact with the respective poles, these wires are endowed with latent energies which, according to the direction given to them, are capable of producing effects the most varied and the most marvellous. We can get from them heat sufficient to melt the most refractory substances, or light of a dazzling brilliancy which approaches nearer to that of the sun than does any other artificial light. With a small fraction of the actual power of these wires we can get volleys of electrical discharges, each one so powerful that the strongest man could not endure it, or we can endow iron with the force of magnetism in its greatest intensity; when brought near one of these wires, the compass forgets its steadfast direction, and commits vagaries which would certainly appear most alarming to navigators who are accustomed to trust their lives to its discretion; and last, but not least, we can decompose the strongest compounds, or combine the most sluggish and inert of elements by the action of the forces at work in these wires.

If a fairy gave you her wand, and told you that it was endowed with power to evoke five of the chief forces of nature, as they are often called—viz., heat, light, electricity, magnetism, and chemical affinity—with all their wondrous effects, you would surely not despise the gift, or neglect to learn its use. Now this wire is such a wand, and Science is the fairy who gives it to you; but, like a wise and beneficent fairy, she tells you that you must patiently examine and study its nature, and that its use will be proportioned to the progress of that study. The successive discoveries and theories which have rapidly succeeded one another in this field of inquiry, and given us a knowledge of this wonderful instrument, constitute one of the most brilliant and instructive chapters of scientific history. It is particularly interesting to notice how the metaphysical theory of contact force, invented by the illustrious Volta, has gradually given way before the steady advance of chemical discoveries, and how we now explain it by describing the actual nature of the transformations which occur in the working of the battery. Many a clear head and steady hand has helped to work out our knowledge of the subject; but, towering above them all in undisturbed preeminence, we see the figure of our own Faraday, a man to whose fertile genius and indefatigable industry we owe the chief discoveries relating to the chemistry of the galvanic battery.

But Chemistry alone is unable to explain the forces at work in this wonderful instrument; she is obliged to call other sciences to her aid, and to combine physics and mechanical discoveries with chemical ones, in her final chain of facts.

It has been proved beyond all dispute that heat is a motion of atoms. Whenever the motion of masses is gradually or partially arrested by the friction of the particles of one against those of the other, we find that the particles get heated. Yet there is no production of force in such a process, only a transfer of motion from masses to atoms. Picture to yourselves a heavy train at the top of a railway incline; let the train run freely down the incline, impelled by its own weight alone, and, while it rushes onwards with headlong speed, let the breaks be applied with the utmost force; the train is stopped, yet the motion which is taken from it is not destroyed, it is merely transformed into heat, for the friction at the breaks evolves such intense heat that it is no easy matter to prevent it setting fire to the wooden parts about them. Again, if we drive the piston of a steam-engine up and down by the pressure of steam—first below, then above it—and, if this piston is con-

nected by suitable machinery with moveable masses, we get those masses set in motion as effectually as if they were drawn by hundreds, or even thousands of horses; and yet, in this case, the force is not created any more than in the former instance it was destroyed; for the steam which presses upon the piston loses heat by the effort, and the heat is transformed into work, from which it can be again recovered.

One of the most important steps of modern science has been the exact measurement by Mr. Joule of the quantity of heat which corresponds to a given amount of mechanical force. The result is stated in diagram 1, which tells us that the force of a pound weight falling 772 feet makes what we call the unit of heat—viz., that quantity needed to raise the temperature of a pound of water 1° F. Whenever mechanical force is expended in heat, or heat transformed into mechanical force, we now know exactly the proportion of the one which can be got from the other. You perceive from this that we not only know heat to be a motion of atoms, but we have even a definite measure of it, as we have of the weights of the atoms themselves.

Philosophers had always believed that matter must be built up of atoms; but it is within the last half century that Chemistry has given actual proof that such is really the case. No doubt there are some eminent men for whom everyone entertains very great respect who speak of the atomic theory as a mere hypothesis; and there are also eminent men who speak of the existence of matter in the same sceptical terms. There is no reasoning upon physical questions without assuming the existence of matter; and our friends only deceive themselves when they fancy they can do without it; and in like manner there is no reasoning upon chemical transformations without the atomic theory; no other theory has ever been found to explain the facts, and without it chemical science—such as it now exists and, I may even say, flourishes—would be transformed into a confused and unmeaning chaos of facts. Every chemist uses the atomic theory when he attempts to explain chemical facts; and chemists are bound to inform those who study nature and her forces from other points of view, that the existence of matter may just as well be denied as the existence of atoms.

I felt it my duty to be the more specific upon this point, because I believe that we have to look to the further development of the atomic theory for the chief progress of scientific chemistry. I have to speak to you not only of atoms as really existing, but also of the movements of those atoms as productive of various important phenomena. It is now a good many years since I showed that chemical decompositions are the results of pre-existing atomic movements—in fact, that the force which produces chemical change is no other than a particular form of atomic motion.

Some of you may probably feel a little hesitation in admitting, that, while a given mass of matter remains in the same place, the atoms of which it is composed are yet in a state of intensely rapid vibration. Let us take the example of a gas—say common air. If air really consists of little atoms in a state of rapid vibration—striking against the sides of any vessel in which the air is confined, and rebounding in virtue of their elasticity—what must we expect to happen if air were introduced into a vessel having a porous side, or a side with a number of very small holes in it? Of course, the atoms would pass through the small holes and get out. In illustration of this I will show you one of those beautiful phenomena of so-called Diffusion which have attracted the attention of so many able investigators of late years, especially of my distinguished friend the Master of the Mint.

I have got here a vessel of which the upper part consists of a porous material—viz., unglazed earthenware. The vessel contains air; and I assert that the atoms of which this enclosed air consists are striking against the porous sides of the vessel and escaping through them. But the outer air is getting into the vessel as fast as the inner air gets out, so that the vessel does not get emptier or fuller, and the blue liquid in this tube, which is really the neck of the bottle, remains unmoved. I will now put the apparatus (still full of air) into a chamber full of a gas consisting of much lighter and more moveable atoms than those of air—in fact, into a chamber full of hydrogen—and you see already that the blue liquid is being driven out by the neck of my vessel. This proves to us that the light atoms of hydrogen are getting in through the porous sides quicker than the heavy atoms of air get out. Each atom of hydrogen weighs only $\frac{1}{14}$ as much as an atom of nitrogen, which is the chief constituent of air; but it gets no benefit from its lightness beyond the power of moving faster; and I will prove to you that gases need not differ in density in order to diffuse into one another by filling this bell-jar with a gas called nitric oxide, which is very nearly equal in density to atmospheric air. At the other side of the porous disc which closes the mouth of the bell-jar will be a similar jar, marked by a black band, containing common air; and, if we get red fumes in the jar with a black rim, that will be a proof that nitric oxide has come out and mixed with the air in that black jar. If, on the other hand, we get red fumes in the jar with the white rim, that will prove to us that air has got into that jar and mixed with the nitric oxide contained in it. You see by the result that each gas is moving through the porous septum.

I must now go a step further, and ask you to follow me into some chemical considerations—in fact, into the consideration of that wonderful process which it has been the chief business and, I may add, the glory of chemistry to explain—I mean the process of combustion. We chemists think of combustion mainly as a process of combination of different materials with each other forming compounds differing from those materials in their properties. But much better for our present purpose is the popular view of combustion, which consists in looking upon it as a plan for getting heat. You really do not burn coals in order to make carbonic acid and water by combining the carbon and hydrogen with oxygen from the air, but you burn them in order to heat your houses or your factories or steam-boilers. Combustion is the process by which some of the inherent motion of atoms is taken from them and transferred in the form of heat to surrounding objects.

If you burn a hundredweight of coal, and collect all the heat which is given by its complete combustion, leaving the products as cold as the original materials before use, you would have enough heat to boil about eighty hundredweight of water—that is, to heat 80 cwt. from 32° F. to 212° F. Now, in such an experiment, we may say that all this heat is taken out of the coals and oxygen by merely combining them; and, accordingly, the products contain just so much less heat, or the motion which constitutes heat, than the original materials before combination.

If we burn iron, as it very often is burnt in forges, we have heat given off, and the oxide of iron contains just that much heat less than the iron and oxygen before combination.

Precisely the same holds good when I break this little bulb and allow the iron which is contained in it to burn in the chlorine contained in this tall cylinder. You see evidences of the heat which is given off by the direct formation of the chloride of iron from its elements; and diagram 2 tells you that, for every pound of chlorine used to form this compound, there are 1492 degrees of heat evolved—assuming that the experiment is performed in presence of water.

If chlorine is used to burn copper in the same manner, forming proto-chloride of copper, there are 962 degrees of heat evolved for every pound of chlorine taken up; and the lesser intensity of the combustion which you witness is an indication of that smaller evolution of heat. Now iron can take chlorine away from any feebler metal, forming chloride of iron, and turning the feebler metal out of its compounds. For instance, if I take a solution of chloride of copper (this deep green liquid), and break a bulb containing finely divided iron inside it, two things will happen at the same time: chloride of iron will be made and chloride of copper will be unmade. We shall have a yellow solution of iron and a fine red powder, consisting of precipitated metallic copper. Before I begin the experiment I want you to notice that the chloride of copper does not act on this air-thermometer, as both are at the temperature of this room. You see how rapidly the powder of metallic iron which I threw into the copper solution acts upon it, destroying the green colour and precipitating the copper; but, at the same time, the liquid is getting hot. The air-thermometer now shows a considerable rise of temperature. If you measured carefully all the heat which is given off when chloride of iron is formed in this indirect manner, you would find it less than when direct combination takes place. Every pound of chlorine which goes to form proto-chloride of iron in this experiment gives off only 530 degrees of heat instead of 1492. Whence this difference of 962 degrees of heat? The reason is obvious. We have here not only made chloride of iron, evolving thereby 1492 degrees of heat, but we have, at the same time, and in the same liquid, unmade chloride of copper; and this chloride of copper absorbs when unmaking just as much heat as it evolved when making—viz., 962 degrees; so that 962 degrees of heat are consumed in the decomposition of the chloride of copper. 1492−962=530 only are obtained. In this experiment the iron was used in the form of a fine powder for the sake of rapidity of action, and the copper remains in a similar form—each little fragment of copper being precipitated beside the little fragment of iron which was taking its chlorine. In fact, the two chemical processes (of combination and decomposition) are mixed up with one another throughout the liquid. But I can effect the same decomposition and the same combination in such a way as to keep them separate—the combination in one part of the liquid, the decomposition at some distance from it.

For this purpose I put a piece of hard carbon into this porous cylinder, and pour some chloride of copper in with it. The porous cylinder thus filled is placed in a jar containing hydrochloric acid, and a plate of amalgamated zinc is immersed in this acid. I must then attach the zinc outside the porous cell to the carbon inside it, by means of a metallic wire. The zinc will then dissolve, forming chloride of zinc, and metallic copper will be deposited from the chloride on the surface of the carbon. The zinc acts just like the iron in my last experiment, only with a little more power; and the carbon does not undergo any change whatever; all the combination takes place on the surface of the zinc plate; all the decomposition on the surface of the carbon plate, where the copper is deposited.

How is it, then, that we have not the full heat of combustion evolved when the zinc combines, and the corresponding heat absorbed or cold produced where the copper is deposited from the chloride? That nothing of the kind occurs is easily seen; but the answer to the question involves the theory of the battery—in fact, the understanding of our fairy's wand. For this little wire has an electric current running through it as long as it connects the combining and reducing plates. It has the same properties, as you can see by the deflection of the magnetic needle suspended beside it, which I mentioned as existing in our wires on this table, and can produce the same kind of effect. Our little instrument is, in fact, one cell of a galvanic battery. If we want more power than this cell affords, we can select a chemical process in which the heat evolved is more in excess of the heat absorbed by the decomposition, so that more heat will be actually available.

Another way of getting more power is by increasing the surface of the plates; and a third process is to increase the number of cells, taking care to render the action in each cell dependent on that in the next, by connecting the zinc plate in the first with the carbon plate in the second, the zinc in the second with the carbon in the third cell, and so on, in so-called Polar order.

Every cell of a galvanic battery consists necessarily of two solid plates capable of conducting electricity, moistened either with one liquid, or with two liquids, kept from mixing by a porous cell, in the pores of which they touch one another. On the surface of one of these plates, which is called *Positive*, a process of combination of some kind goes on, whether Oxidation or Chlorination, of which the effect is to evolve Heat; and at the surface of the other plate, which is called *Negative*, a process of unburning goes on by which Heat is absorbed.

It is not necessary that the process of combination at the surface of the positive plate should take place, as in the instance before us, between metallic particles from the very substance of the plate, and a constituent of the liquid; nor is it necessary that the decomposition should be always effected by the deposition of a metallic body upon the surface of the plate.

I have here a little battery, consisting of two cells, so constructed that the chemical laws of its action are carried out in an entirely different manner. Each cell contains two platinum plates, one of which is quite clean, while the other is coated with the brown binoxide of lead. We may consider this plate as consisting of binoxide of lead, for the platinum beneath it only serves to connect the particles of that substance with the connecting wire. The bright platinum plate is immersed in nitrous acid contained in the porous cell, and the peroxide of lead is immersed in nitric acid outside that porous cell. When the battery is at work the nitrous acid becomes oxidized and converted into nitric acid on the surface of the positive plate, and the peroxide of lead dissolves off from the surface of the negative plate by losing oxygen.

You can see the facility with which this transfer of oxygen takes place from the one body to the other by the decolorization of the brown peroxide which takes place when I mix it in this foot-glass with a solution of nitrous acid.

You perceive by the testimony of this little battery that the oxidation of nitrous acid replaces the chlorination of the zinc in our first cell, and that de-oxidation of peroxide of lead here occurs where dechlorination of copper took place in that cell.

In all galvanic cells the plates communicate, not only by the liquids in which they are immersed, but also by the metallic connecting wires; and while the cell is at work a galvanized current passes, not only through the connecting wire, but also through the connecting liquid. Now, there is this important difference between metallic and liquid conductors—wires are very good conductors, whilst liquids are very bad ones in comparison; and, if we put the two plates into the liquid of a cell without connecting them by a wire, there is no current, nor is there that chemical process, which we know to be its necessary accompaniment. The use of the connecting wire does supply what is still wanted for the occurrence of the combining process at the one plate, and the decomposing process at the other; and we are unavoidably led to consider that the electrical current is the process by which motion or vibration of atoms is transmitted through the wire from the combustion-plate to the separation-plate. The evidence in favour of this conclusion is strengthened, and, at the same time, rendered more precise by a study of the process which takes place in liquid conductors. It so happens that, inasmuch as the liquids are composed of several elements, and as they undergo a permanent change during the process of conduction, we are able to gain a most valuable insight into the very behaviour of the component atoms while they are conducting the current. This is so very important a part of my argument that I must beg leave to state it to you, although I must confess that it deals with questions respecting the position and arrangement of atoms which I would gladly have spared you had it been possible to do so.

It will be most convenient for our purpose to select for consideration the very simple case of a cell containing a zinc plate and a copper plate immersed in hydrochloric acid. The zinc dissolves by taking chlorine away from the hydrogen, and hydrogen is evolved from the surface of the copper plate.

It is generally admitted that the first step of the process is the establishment of a Polar arrangement of the molecules of hydrochloric acid, of such kind that the chlorine atoms are turned towards the zinc, the hydrogen atoms towards the copper. The atom of chlorine next to the zinc then combines with it, forming chloride of zinc, and at the same time the atom of hydrogen next to the copper is set free and escapes. But the chlorine cannot combine with zinc without getting rid of its hydrogen at the same time to the next atom of chlorine in the chain; and this second atom of chlorine must combine with another atom of hydrogen instead of the one which is thus taken from it. This goes on, till at the end of the chain of particles, we have in this manner an atom of hydrogen which loses its chlorine and cannot get another in exchange, but escapes uncombined on receiving the necessary impulse from the copper plate.

We see that there can be no combining current without a motion of the atoms. Atoms of chlorine must come in contact with the zinc to combine with it, and the atoms of hydrogen in contact with the copper to escape from it; and the polar arrangement must re-establish itself throughout the whole liquid, from the zinc to the copper, before the next decomposition ensues. It would be unnecessary to discuss at present the particular manner in which this atomic motion takes place in the conducting liquid; but there is no doubt of the fact that each atom of chlorine,* . . . . after each decomposition, and then to get over so as to touch the positive plate, while the hydrogen gets next to the negative plate. These atomic motions have been long since shown to take place in the conducting liquid.

Now, when a current of electricity is passing through a liquid, it produces upon every contiguous magnet the same effects as the same current running through a metallic conductor.

You will see, when I send the current of my battery through this tube full of liquid, that the needle will be deflected exactly in the same manner as if I send a current of equal strength through a rod of metal. Metallic conductors transmit with facility from the positive plate those vibrations which carry over the force needed for the liberation of the metals at the negative plate; while liquids sluggishly and reluctantly allow a similar vibration to take place along their constituent atoms so as to enable the atoms to get into the places where they are wanted for the chemical action; but the liquid is always behindhand with its work, and opposes the chief resistance to the completion of the galvanic circuit.

We have now got to the point to which I wanted to bring you, and I will not attempt any further particulars. Our fairy wand differs from an ordinary copper wire by having pulsations going through its length, from atom to atom, which transmit mechanical force from a process of combination, which disengages it, to a process of decomposition, which absorbs force.

Any heating effects, or lighting effects, or magnetic, or electrical, or chemical work which the wire is made to do, are so much resistance to the chemical action of the battery, and afford outlets for some of that redundant force evolved by its combustions, which, if the battery were closed by a short thick wire, would go to heat the liquids in the cells.

You see how the resistance opposed by this platinum wire is overcome by the energy of my battery, which forces the heavy atoms of this metal to an unaccustomed energy of action—more, in fact, when I shorten somewhat the wire, than it can bear without fusion; or, if I discharge it through the steel substance of this stout file, you see how little able is even this material to withstand its action in contact with the air. Again, if I discharge it between these carbon points when in contact with each other, and then screw them a little asunder, I get luminous discharge from the intensely heated state of the particles of carbon.

I must now leave to your consideration this outline of the Chemical Theory of the Battery. What we know of the working of this wonderful instrument is, no doubt, very little, compared with what remains to be discovered; and of that little I have described to you only a very small part—in fact, only the very foundation of the edifice. If you have any doubts on the subject, I trust that you will ascribe their existence to the imperfections and shortcomings of my exposition, and not lay them to the account of the theory itself.

* Having failed to obtain Professor Williamson's exact words here, we leave a space to be subsequently filled up.

SECTIONAL REPORTS (*continued*).

Section A.

Researches on the Moon. By Professor Phillips.—The author, having on previous occasions presented his views as to methods and objects of research in the moon, was desirous now of stating a few results, and exhibiting a few drawings, the fruit of recent examinations of the moon by means of a new equatorial by Cooke of York, with an object-glass of six inches aperture. In sketching ring-mountains, such as *Theophilus* and *Posidonius*, the author remarked upon the changes of aspect which even a small alteration in the angles of elevation and azimuth respectively produces. Taking an example from *Cyrillus*, with its rocky interior, and fixing attention on the nearly central mountain, it always appears in the morning light to have two principal unperforated masses. By a slight change in the direction of the light, the division of these masses is deeply shaded on the north or deeply shaded on the south, and the figure of the masses—*i.e.*, the limit of light and shade—seems altered. A slight change in the angle of elevation of the incident light makes more remarkable differences. On *Posidonius*, which is a low, nearly level plateau, within moderately raised borders, the mid-morning light shows with beautiful distinctness the shield-like disc of the mountain, with narrow broken walls, and, in the interior, broad, easy undulations, one large and several smaller craters. In earlier morning more craters appear and the interior ridges gather to form a broken terrace subordinate to the principal ridge. This circumstance of an interior broken terrace, under the high main ring of mountain, is very frequent; but it is often concealed by the shadow of the great ridge in early morning shadows. To see it emerge into half-lights, and finally to distinct digitations and variously directed ridges, as the light falls at increasing angles, is a very beautiful sight. But it is chiefly to the variations in the central masses of lunar mountains and their physical bearings that the author wishes to direct attention. Many smaller mountains are simply like cups set in saucers, while others contain only one central or several dispersed cups. In *Plato* is a nearly central very small cup-shaped crater, bright, and giving a distinct shadow on the grey ground, as seen by Mr. Lockyer, Mr. Birt, and Professor Phillips himself. But in the centre of many of the larger mountains—as *Copernicus*, *Gassendi*, and *Theophilus*—are large masses of broken rocky country, 5000 or 6000 feet high, with buttresses passing off into collateral ridges, or an undulated surface of low ridges and hollows. The most remarkable object of this kind which the author has yet observed is in *Theophilus*, of which mountain two drawings are given, in which the author places equal confidence, except that the later drawing may have the advantage of more experience. The central mass is seen under powers of from 200 to 400, and appears as a large conical mass of rocks about fifteen miles in diameter, and divided by deep chasms radiating from the centre. The rock-masses between these deep clefts are bright and shining, the clefts widen towards the centre, the eastern side is more diversified than the western, and like the southern side has long excurrent buttresses. As the light grows on the mountain, point after point of the mass on the eastern side comes out of the shade, and the whole figure resembles an uplifted mass which broke with radiating cracks in the act of elevation. Excepting in steepness, this resembles the theoretical Mont d'Or of De Beaumont; and, as no craters have been observed in this mass of broken ground, the author is disposed to regard its origin as really due to the displacement of a solidified part of the moon's crust. He might be justified by Professor Secchi's drawing of *Copernicus* in inquiring if the low excurrent buttresses may indicate issues of lava on the southern and western sides. On the whole, the author is confirmed in the opinion he has elsewhere expressed, that on the moon's face are features more strongly marked than on our own globe, which, rightly studied, may lead to a knowledge of volcanic action under grander and simpler conditions than have prevailed on the earth during the period of subaerial volcanoes. Professor Phillips also exhibited a drawing of *Aristarchus*, showing some undescribed features in the aspect of that, the highest part of the moon's surface. The drawings were among the most beautiful it has ever been our good fortune to inspect, and proved the superiority of sketching over photography in the delineation of details.

Professor Hennessy inquired whether Professor Phillips had met with any instances during his researches where the fissures, instead of being narrow at the lower part and wider towards the top, were, on the contrary, narrow above and wider below. Fissures of this latter description were met with in Java, and indicated a formation arising from external causes, as those described by Professor Phillips were manifestly caused by internal disruptive forces.—Professor Phillips replied that he had not met with any instances of fissures of the class spoken of, and remarked that anyone who went to see the process of extracting the silver from lead ore would have an opportunity of witnessing, on a small scale, causes in operation producing exactly similar effects to those observed on the surface of the moon. After the process was completed, and the litharge all blown off from the pure silver, the observer would be very apt to go away, nothing apparently remaining to be seen; but, if he waited for a short time, as the mass of silver cooled, he would soon see its surface torn up by explosions from within, caused, as he (Professor Phillips) believed, by the extrication of oxygen gas, and elevations and fissures produced exactly resembling those on the surface of the moon as observed in the best instruments.

On the Distances of the Planets. By R. S. Browne.—The communication consisted of a new series of numbers, for expressing the distances between the planets, which more closely approximate to the known distances than do those suggested by Bode, as shown in the following table:—

Bode's Law.			R. S. Browne's Series of Numbers.			
						Reduced Nos.
1	4	4	1	4	4	3,6
2	4 + 3	7	2	4 + 3	7	6,3
3	4 + 2 · 3	10	3	7 + 4	11	10
4	4 + $2^2 \cdot 3$	16	4	11 + 7	18	16,6
5	4 + $2^3 \cdot 3$	28	5	18 + 11	29	26,6
6	4 + $2^4 \cdot 3$	52	6	29 + 18 + 11	58	50,2
7	4 + $2^5 \cdot 3$	100	7	58 + 29 + 18	105	90,5
8	4 + $2^6 \cdot 3$	196	8	105 + 58 + 29	192	175
9	4 + $2^7 \cdot 3$	388	9	192 + 105 + 58	355	322

On Focal Adjustment of the Eye. By W. B. S. Proctor.—The author explained the construction of an apparatus for testing the "focussing" power of the eye.

On Spectrum-Analysis. By Professor Plücker of Bonn.—It is generally admitted that every gaseous body rendered luminous by heat or elec-

tricity emits light, which if examined by the prism, gives a characteristic spectrum. By any one of the brilliant lines, whose position has been measured, of such a spectrum the examined gas may be recognised. In order to give to spectrum-analysis a true and certain basis, the pure spectrum of each elementary substance must be known. Very recently, some eminent philosophers, in examining such spectra, met with unexpected difficulties, causing them to doubt the new doctrine. These doubts are not founded: the fact being that the molecular constitution of gases is much more complicated than has been generally admitted; and on this point a new importance—a physical one—is given to spectrum-analysis: as by the spectrum of a gas not only its chemical nature, but its more intimate molecular structure may be indicated. Selecting out of the results already obtained the history of the spectra of the two elementary bodies of sulphur and nitrogen, the author states that, in order to analyse the light produced by the electric current, passed through a rarefied gas, he gave to the tube which included the gas such a form that its middle part was a capillary one—thus obtaining a brilliant film of light. The date of the first paper on this subject is the 12th of March, 1858. After having provided himself with apparatus more appropriate to his purpose, about a year ago, Professor Hittorf of Münster joined him in taking up his former researches. The very first results obtained in operating on gases of a greater density opened out an immense field of new investigation. It was found that the same elementary substance may have two or three different spectra depending on temperature. In the experiments, in which Ruhmkorff's induction coil was used, in order to increase the heating power of the discharge, a Leyden jar was also added. Now, in heating slowly the Geissler's tube by means of a lamp, in order to transform a part of the sulphur into vapour, all accidental spectra, if there be any, will disappear, and a pure and beautiful spectrum of sulphur will be obtained. If the Leyden jar be interposed this spectrum will abruptly be replaced by a quite different one. The author was generally led to distinguish two quite different classes of spectra—spectra of the first class, consisting of a certain number of bands variously shadowed by dark lines, and spectra of the second class, consisting of a great number of most brilliant lines on a dark ground. Sulphur has one spectrum of the first class and another one of the second, and each of these two spectra may be obtained at will. In operating on a spectral tube containing nitrogen, at a pression of about 50 m., without the Leyden jar, a beautiful spectrum of the first class will be produced. After interposing the jar a spectrum of a second class will be seen. But here the case is more complicated still. The above-mentioned spectrum of the first class is not a simple one; but it is produced by the superposition of two spectra of the same class. Ignited nitrogen at the lowest temperature has a most beautiful colour of gold. When its temperature is raised its colour suddenly changes into blue. In the first case the corresponding spectrum is formed by the less refracted bands extended towardt he violet part; in the second case it is formed by the more refracted bands extended towards the red. Nitrogen, therefore, has two spectra of the first class, and one spectrum of the second class. The final conclusion, therefore, is that sulphur has two, nitrogen three, different allotropic states. It may appear very strange that a gaseous body may have different allotropic states—*i.e.*, different states of molecular equilibrium. It may appear, perhaps, not more strange that a substance, hitherto supposed to be an elementary one, may really be decomposed at an extremely high temperature. From spectral analysis it would appear that sulphur and nitrogen may be decomposed. Chloride of zinc or cadmium, for instance, exhibits two different spectra. If heated like sulphur, and then ignited by the discharge of Ruhmkorff's coil, you will get a beautiful spectrum either of chlorine or of the metal, whether the Leyden jar be interposed and withdrawn. There is, in this case, dissociation of the elements of the composed body in the highest temperature, and recomposition again at a lower temperature. Dissociation may, therefore, be considered as an allotropic state, as long as decomposition be not proved by the separation of the elements.

Professor Miller, F.R.S., remarked that these researches of Professor Plücker, if generalized by extension to other elementary substances, would remove the principal difficulty which lay in the way of the complete adoption of Kirchhoff's theory of the cause of Fraunhofer's black lines. It was well known that the absorption bands produced by the vapours of iodine, bromine, mercury, hydrogen, and some other bodies were entirely different from the system of bright lines, produced by the ignition of these bodies by the electric arc. If, however, experiments prove that these elements, like sulphur and nitrogen, had spectra, which varied with the temperature, the theoretical objection disappeared, though the practical difficulty of identifying the different elements was increased by the complexity of the results thus indicated.

Section B.

The business of this Section was commenced by the following papers on Local Manufactures:—

On Fire-clay Goods. By Mr. Joseph Cowen, jun.—The author stated that fire-clay, which is obtained in large quantities in the two counties of Durham and Northumberland, usually lies beneath the coal-measures in layers, varying in thickness from twelve inches to five or six feet. The refractory character of any sample of fire-clay is determined by the proportions in which silica and alumina are contained, and by the absence of lime, iron, and other easily fluxible substances. The best descriptions of fire-clay, those which, when manufactured, are capable of resisting the greatest heat, always contain a large portion of silica. The following is a series of analyses of samples of fire-clay taken from seven seams, all worked in the mines belonging to one fire-brick manufactory, situated a few miles west of Newcastle:—

	1.	2.	3.	4.	5.	6.	7.
Silica . . .	51·10	47·55	48·55	51·11 .	71·28 .	83·29 .	69·25
Alumina . .	31·35	29·50	30·25	30·40 .	17·75 .	8·10 .	17·90
Oxide of iron.	4·63	9·13	4·06	4·91)			2·97
Lime . . .	1·46	1·34	1·66	1·76)	2·43)	1·88)	
Magnesia . .	1·54	0·71	1·91	trac. .	2·30)	2·99)	1·30
Water and organic matter	10·47	12·01	10·67	12·29 .	6·94 .	3·64 .	7·58

The remaining part of the paper treats at length of the various applications which have been fonnd, especially in late years, for articles made from this substance.

On Glass. By Mr. R. W. Swinbourne.—The author was desired by the Committee of Local Industry to prepare a paper on the glass manufacture of the district, in which he has been much assisted by Messrs. Jas. Hartley and Co. of Sunderland, Messrs. Sowerby and Neville of Gateshead, Mr. Bowron of Stockson, and Mr. Wailes of Newcastle. The paper treats at length on plate, crown, sheet, flint, and bottle glass, and is, of course, principally of local interest. It is worthy of remark that ordinary window glass was first used in Great Britain for architectural purposes at the great monasteries at Monkwearmouth, on the River Wear, and at Jarrow on the Tyne. The venerable Bede, our first ecclesiastical historian, who flourished at the former place in the seventh century, relates that his cotemporary, the Abbot Benedict, sent for artists beyond seas to glaze the Monastery of Wearmouth. Such was the change made in their churches by the use of glass instead of other and more obscure substances for windows, that the unlettered people avowed a belief, which was handed down as a tradition for many generations, "that it was never dark in old Jarrow Church." By a singular coincidence the first manufactory of window or crown glass in Great Britain was established at Newcastle-upon-Tyne within a few miles of these monastic establishments. In the year 1616, Admiral Sir Robert Maunsell erected glass-works at the Ouseburn, Newcastle, which were carried on without interruption till nearly the middle of the present century. Crown window glass is no longer made on the Tyne, and as an art it is declining everywhere; but the manufacture of sheet glass has of late years been most largely increased, and is carried on to a great extent in the adjoining district of the river Wear, where the quantity produced by Messrs. James Hartley and Co. alone is very nearly equal the entire produce of the six extinct crown glass manufactories on the river Tyne. The beautiful art of coloured glass, or what is termed stained glass, has been carried on most successfully for some years in Newcastle by Mr. William Wailes and others; and the tasteful designs and beautiful colouring of Mr. Wailes's numerous works have given him a great celebrity throughout the kingdom. A great improvement has been made in this description of glass, inasmuch as exterior staining has been superseded by glass made of the required tint in the crucible of the manufacturer. The glass, therefore, is not stained, but is inherently of its peculiar colour. This process of making coloured glass in the crucible has restored the art to its pristine state, for in such manner this glass was made by the old masters. By its means the brilliancy and durability of the old coloured glass has been obtained, and all the colours of antiquity are produced by our modern manufacturers in greater brilliancy, ruby alone excepted. It is ascertained that there is something in the undulating and imperfect surface of the glass of the fourteenth century which renders it more adapted to display intensity of colour than the more perfect glass of modern times. Hence the coloured glass-makers resort to the use of a glass as the basis of their colour which of itself is of the most rude and imperfect character.

The manufacturers of window glass on the river Tyne have originated many improvements in the process. In 1817 Mr. Charles Attwood of this town made crown glass by using the insoluble part of kelp, separated by lixivation from its saline ingredient, which he rejected, and in its place he used the carbonate of soda of commerce. The analytical examination of this insoluble portion of kelp was undertaken in 1829 by the *employés* of a large crown glass manufacturer at South Shields, with the assistance of the late eminent Dr. Turner of the London University; and, after a long series of experiments, most seriously impeded by the excise duty and regulations, it was discovered that kelp in any form might be safely abandoned, and that better results with a great saving could be obtained by the use of lime and carbonate of soda. The alkaline ingredient in plate glass was for many years obtained from the Barilla, from Alicant, or Teneriffe, and was superseded by an alkali prepared by Lord Dundonald, by the decomposition of common salt by carbonate of potash—carbonate of soda and chloride of potassium being the results. The latter was separated by priority of crystallization; and, the remaining liquor being evaporated, carbonate of soda was obtained in a solid state, and was so used by the plate-glass maker. This process was used in England up to the year 1832, when it was discontinued at the Plate Glass Works at South Shields. Carbonate of soda of commerce, in a refined state, at less than half the price, was substituted, and its use has become general throughout England.

On Earthenware. By Mr. C. T. Maling.—This paper dealt principally with the history of the manufacture.

On Oxidation of Beta Hexylic Alcohol. By Professor Wanklyn, F.R.S.E.—This paper contained an account of some researches by the author and Dr. Erlenmeyer "On the Oxidation of Beta Hexylic Alcohol." Beta hexylic alcohol—the alcohol which was obtained from mannite, and which belongs to a new series of alcohols isomeric with the alcohols of the vinic series, but differing widely from them in properties and reactions—is easily oxidized by a mixture of bichromate of potash and dilute sulphuric acid. Its first product is beta hexylic aldehyd, thus:—

$$\beta\, C_6 H_{14} O + O = \beta C_6 H_{12} O + H_2 O.$$

The next products are carbonic acid, water, and butyric acid, thus:—

Hexylic Aldehyd. Butyric Acid.

$$\overbrace{\beta\, C_6 H_{12} O} + O_7 = 2\, CO_2 + 2\, H_2O + \overbrace{C_4 H_8 O_2}.$$

The interest attached to this decomposition depends upon its furnishing a proof that two atoms of carbon in the beta alcohol are differently combined from the remaining four.

In the normal or alpha alcohol the first stage of oxidation is the production of the aldehyd:—

$$\alpha\, C_6 H_{14} O + O = \alpha\, C_6 H_{12} O + H_2 O.$$

The second stage, the production of corresponding fatty acid:—

Caproic Acid.

$$\alpha\, C_6 H_{12} O + O = \overbrace{C_6 H_{12} O_2}.$$

It would seem that, while in the alpha or common series of alcohols the union of the carbon atoms with one another is quite regular, the reverse obtains in the beta series.

On a New Gas Furnace for Scientific and Practical Purposes. By Mr. G. Gore.—Without a diagram, it is impossible to impart a sufficiently intelligible description of the apparatus. The chief conditions of success in the furnace are—sufficient gas, a suitable degree of draught, and proper regulation of gas to air.

On Lucifer Matches. By Professor Abel, F.R.S.—Having mentioned the components of the exploding substance, the author went on to notice the possible causes of accident in the transport of matches. The result of experiments proved that no degree of heat to which, under all ordinary circumstances, matches were likely to be exposed in their transport or otherwise would suffice to lead to their spontaneous ignition. It was quite within the range of possibility, however, that on board ship continuous concussion, combined with

heat, might bring about accidental ignition, while it might be granted that the accidental ignition of one or two boxes in securely closed cases might frequently occur almost without a possibility of fear of its spreading to other boxes. A knowledge of the causes of the accidental ignition of gunpowder and other explosives rendered it advisable that such precautionary measures as were obvious and easily observed should be attended to in the shipment of matches, with the view of reducing such occurrences to the minimum extent.

SECTION C.

On Coal, Coke, and Coal-mining in Northumberland and Durham. By Mr. Nicholas Wood and others.—This communication, being one of great length and elaborate character, an abstract only was given, *vivâ voce*, by Mr. Wood. The material substance of the paper bore chiefly upon the practical questions involved in the coal-mining and coke interests of Northumberland and Durham; and, as it would be impossible to give an abstract within reasonable limits, we defer our notice until it appears, as announced, as a published memoir by the Northern Institute of Mining Engineers.

In connexion with these coal-bearing strata, Mr. Sopwith pointed out the geographical extent and stratigraphical thickness of the mountain or carboniferous limestone series upon which they rested, tracing it from its obscured position beneath the coal, through a gradually-ascending series of outcroppings, till the mountain of Cross Fell, in Cumberland, was reached, where it attained an elevation of 2901 feet above the sea-level, the highest point connected with carboniferous coalfields of the district. The mineralogical character of the series was varied by seams of shale, sandstone, and clay—the limestone bands being of different thicknesses, from three feet (the "Fell Top" limestone) to sixty feet (the "great limestone"). Naturally, this thickest bed was the most important in an economic point of view, most of the lead in the various districts of Alston Moor, Weardale, and Teesdale being obtained from it.

The President, remarking upon the value of the communications, of which abstracts only could now be presented to the Section, said that the authors were in a position to give important opinions upon the question of the duration of the coal-fields.

Mr. Wood thought the question was rather one of the extent of demand than of the quantity of coal unwrought. He considered, however, that Sir W. Armstrong, in his estimate of the duration of their coal-fields, had overlooked the importance of that area which lay beneath the sea. Of this they had no real knowledge, from the absence of actual facts to guide them, and he therefore considered any estimate as premature.

On the Fossil Teeth of a Horse found in the Red Clay at Stockton. By Mr. J. Hogg.—The specimens exhibited were those of *Equus Caballus fossilis*, found in a red clay of post-glacial age.

On the Coal-Measures of Sydney, Cape Breton. By Mr. Lesley.—This communication was of too slight a character to give an abstract of, or hang any remarks upon.

On the Magnesian Limestone of the County of Durham. By Messrs. G. B. Forster and J. Daglish.—The water-bearing properties of these rocks rendered their study one of the utmost importance to those engaged in mining operations. In shafts sunk through them for the purpose of winning the coal below, large quantities of water had been met with. These were chiefly derived from gullies and fissures, close observation of which had enabled the author to determine and fix the position of a line of saturation, which, though commencing at the sea-level, neither continued on this plane, nor followed any line of stratification, nor the undulations of the surface, but rose with a uniform slope of sixty feet per mile as it passed inland. Enormous quantities of water had often been met with in piercing a sandstone-rock of the series known, locally, as "the yellow, or incoherent sand," from the rapid manner in which it disintegrated when exposed to the atmosphere. In the sinking of Murton Winning Pit nearly 10,000 gallons of water per minute were pumped out of this loose sandstone by engines exceeding in the aggregate 1500 horse-power. The causes of this remarkable accumulation of water were stated to be, first, the stratigraphical arrangement of the rocks; second, the superficial contour of the district; third, the permeability of the rock-series. The existence of this enormous and, to mining enterprise, troublesome volume of water may be studied from another and brighter point of view: for, in economic relations with those who dwelt upon the surface, it afforded an inexhaustible supply of pure and agreeable water—the towns of South Shields and Sunderland being entirely supplied by the water pumped at Cleadon, Fullwell, and Humbledon Hill.

At S. Hetton Collieries a line of uniform salt water, not identical either with line of stratification or having any relation to sea-level, had been observed. As regarded the stratigraphical relations of the lower Permian rocks with the carboniferous beds beneath, the authors expressed an opinion that variations due to local changes had not been sufficiently studied, though the balance of evidence, as at present obtained, tended to refer the rocks to the coal age.

Professor Harkness, F.R.S., remarked that in Cumberland an enormous development of superior sandstone, 4000 feet in thickness, rested unconformably on the carboniferous rocks.

Professor Phillips, F.R.S., after stating that the beds above the accepted coal-measure strata were subjects of general uncertainty, proceeded to remark upon the great local diversity in the series beneath the magnesian limestone, but was of opinion that no decision could be formed as to general unconformability. Some of the "Permian" red beds of Derbyshire certainly belonged to the coal-measures. The colouring of inferior rocks by the abstraction of colour from superior strata was also a subject of much importance in the determination of stratigraphical position.

Mr. Howse was of opinion that the coal-flora extended far up into "Rothliegende" beds in England.

Mr. Godwin-Austen, F.R.S., after remarking upon the difficulties which surrounded the question, agreed with Mr. Howse as to the probable upward extension, under peculiar conditions, of a carboniferous flora; but very close examination was necessary before the truth or error of this hypothesis could be put to the test. Physical geologists had pointed out that, in parts of the accepted carboniferous series, equal unconformities occurred to those which they were taught separated that system from the Permian. It appeared to him that much of the so-called Permian belonged to the upper coal-measures; and the simplification of the geological series by the omission of these portions of the group would be a philosophical gain.

On the Fossils of the Skiddaw Slates. By Professor Harkness, F.R.S.—The Skiddaw Slates, lying above the Lingula Flags, had at one time been regarded as Azoic. They were first brought within the series of rocks producing life-remains by Professor McCoy, who described two graptolites and a sea-plant (*Chondrites*) discovered in them. Investigations lately made by himself in the neighbourhood of Keswick had removed them in palæontological character very far above their supposed position. He had obtained the remains of a shrimp-like crustacean, allied to *Ceratiocaris*, upon which Mr. Salter had founded a new genus, *Ceryocaris*, and a shell of *Discina*. The family of graptolites, regarded as typical of the age, had been increased by his investigations, representatives of seven genera having been obtained, four of which were confined to this group of rock-strata. The forms discovered belonged to the genera *Dendrograpsis*, *Phyllograptis*, *Tetragrapsis*, *Dichograpsis*, *Didymograpsis*, *Diplograpsis*, and the better-known *Graptolites*. In conclusion, Professor Harkness alluded to the fact that the forms of graptolites which occur the earliest in time are of the most complicated design, thus affording no support to the development theory.

Professor Phillips, commenting upon the ignorant prejudice that no forms of life existed in the Skiddaw Slates, considered that a sound conclusion upon the larger questions involved could not at present be taken, from lack of sufficient evidence.

On the Hornblendic Greenstones, and their relations to the Metamorphic and Silurian Rocks of the County of Tyrone. By Professor Harkness, F.R.S.—The metamorphosed rocks of this district were considered by the author to have been thus acted upon by syenitic dykes, being also accompanied by intrusive masses, which may be referred in age to those which occur with beds of volcanic ash in the Bala rocks. He regarded them as unaltered representatives of the Upper Gneiss of Scotland, described by Sir R. Murchison.

Mr. Jukes was of opinion that the Donegal series was an equivalent in time to the metamorphic rocks of North Wales, which were referred to a Lower Silurian age.

Professor Ansted pointed out that a much metamorphosed rock put on the semblance of granite, and was hardly to be distinguished from it; this was a matter of moment in any determination of a physical question belonging to altered rocks.

On two new Coal-Plants from Nova Scotia. By Dr. Dawson, F.R.S.—After giving diagnoses of these new Lepidodendroid plants, the author proceeded to remark that recent investigations led him to refer the genera *Ulodendron*, *Bothriodendron*, *Lomatophloios*, *Leptoxylon*, *Pachyphloios*, together with *Halonia punctata* and some *Lepidodendra*, to Brongniart's genus *Lepidophloios*, distinct genera and species having been erected upon fragmentary portions of the same plant.

In the discussion which ensued, Mr. E. W. Binney was of opinion that more of the central axis of *Lepidophloios* should be obtained before the recorded genera and species were expunged from the list. In illustration of the loose state of fossil botany, he pointed out that the character from which *Lepidodendron* was named was one misunderstood, the scales upon the branch being knobs when found in an uncompressed state. Very varied markings existed upon the external surface of every plant of the group; and great caution should be exercised in describing any plant of the coal-flora from fragmentary remains.

Professor Morris said that fossil botany had suffered from the zeal of species-makers more than any department of palæontology. He recommended geologists to study the plant-remains *in situ*. As regarded diversity of form in bark-scale, and other sculpturing of the exterior of the stem or rachis, he called attention to the difference which existed between the scales upon the upper and lower portions of the trunk of both existing and fossil tree-ferns. The age of the plant was also productive of such dissimilarity.

On Models illustrating the Contortions in Mica-schist, and Slate. By Mr. Sorby, F.R.S.—The models exhibited were formed of six bands of india-rubber (combined in one instance alternately with a less yielding substance) about a foot in length, fastened tightly with a brass clamp at one end, the opposite ends being in the purely india-rubber model left loose, and in the other one fixed tightly in a corresponding brass clamp. These, being bent by compression applied from end to end, exhibited in the first-named illustration a simple curve in the integral components; the inner side of the curve being compressed, and exhibiting a character allied to cleavage-lines, while the fibres of the exterior of the curved angle were lengthened and weakened. Treating in a like manner the series of bands gathered into clasps at both ends, the result was an unequal series of contortions, leaving interstices. These forms, produced by lateral pressure, the author compared with those flexures and contortions exhibited by mica-schist and slates, in the more complex example, and in a lesser degree, by many curved outlines in schisty and bituminous rocks, remarking that the slikenside appearance shown on the exterior of the curve in rock-layers belonging to the latter group resulted from a tendency in their component particles, so weakened, to slide over each other.

Professor Ansted, bearing testimony to the models being most excellent and suggestive, said that such results were naturally obtained under crumpling and squeezing forces, more especially as to the interstices in the mass so acted upon.

Professor Tyndall remarked that an analogous phenomenon was observable in the sliding motion of glacial ice. When any part of a glacier in its downward course became wedged, a kind of ribboned, laminated structure allied to cleavage was developed in the interior of the great curves into which the slowly-moving mass was moulded.

Professor Phillips illustrated the phenomena which Mr. Sorby's excellent models had rendered so clear by a reference to the rocks in the higher region of Loch Lomond, which contained hundreds of laminæ, exhibiting a series of increasing and decreasing flexures, and unequal intervals filled with subsequent crystallizations. In pursuance of this most interesting study it should be borne in mind that it gave the clue to ascertain the direction of the pressure by observing the maximum curves through any rock series. In the instance of the Loch Lomond contorted rocks he was of opinion that the history of their mechanical treatment was that of a series of flexures, the result of so many independent exertions, with interspersed periods of rest, rather than of any one great effort. He pointed out the necessity of studying the mechanical sciences in aid of any attempt to throw light upon the manner in which any of the displacements, whether slow or rapid, of the earth's crust had taken place.

Mr. Sorby, in reply, illustrated the cleavage lines alluded to by Professor Tyndall by a diagram

showing that the lengthening of the fibres in the exterior of the curve in a bent bar of iron was accompanied by a corresponding shortening of them in the inferior angle of the curve, producing the appearance alluded to as occurring in ice. All substances, so treated, more or less exhibited this.

SECTION D.

Report of the Committee appointed for Exploring the Coast of Shetland by means of the Dredge. By Mr. Gwyn Jeffreys, F.R.S.—After explaining the nature and object of such expeditions, and showing the advantage which accrued to science from them, he gave a short history of the zoological discoveries which had been made during the last half-century in the Shetland seas by Fleming, Forbes, and other naturalists. Mr. Jeffreys himself had been five times there with his dredge since 1841, and had contributed much to our knowledge of the mollusca in this district. He then stated some important results from the recent explorations, chiefly bearing upon geology—viz., that the colour of shells living at depths of from 80 to 90 fathoms was as bright and variegated as that of other shells of the same species found in shallow water or even between tide-marks; that, at a certain distance from land, the bottom of the sea, at the above depth, was unaffected by any tide or marine current, and formed a quiescent area, in which mollusca, previously known only as fossils of the coralline crag, still survived and flourished. That the generally received notion that some kinds of mollusca are "dying out" is erroneous, because the extent of ground that can be investigated by means of the dredge is extremely limited, and species often are locally distributed; that no species appears to be confined to any one part of the seas of Northern Europe, although some may be more local than others; that the composition of the sea-bottom varies considerably in the same districts; that the gulf-stream does not reach the eastern or northern coast of Shetland; that the sea-bed here has sunk considerably since the close of the glacial epoch; that mollusca procured from a depth of 75 fathoms and upwards, being placed in a shallow vessel of sea-water taken from the shore, were not apparently affected in the slightest degree by the sudden change of bathymetrical conditions, but continued lively and active for many days; and that all marine beds of a comparatively recent formation are necessarily fossiliferous, unless it can be shown that they have been subjected to chemical action. The appendix contained several tables relating to the mollusca and the mineralogical contents of a small portion of the sea-bottom. From one of these tables it appeared that the author had added from this source, since the publication of Forbes and Hanley's work, no less than twenty-three species of shells, particulars of which will be given by Mr. Jeffreys in his forthcoming volumes on British Conchology.

The Rev. Mr. Norman remarked that the great difficulty in dredging the Shetland Seas was that the animals were only found within extremely limited areas. Last year he was engaged in dredging 160 miles due east of Shetland, and this year from 20 to 40 miles to the north. In 1861 he succeeded in drawing up a great number of objects of a Scandinavian species, of which only one specimen at that time was in preservation; but he was unable to save them. The peculiarity of these seas was that what they found they found in great abundance; but the difficulty was to hit upon the precise spot; and it must not therefore be supposed that the marine zoology of any point there could be worked out in two or three visits. Bearings were out of the question; and the only way in which he had been able to reach the same ground a second time was by employing the manager of a fishery, who knew the ground, to take soundings of the bottom. There was no difference of colour between specimens taken on shore and those of the same genus taken in deep water.

On the Zoology of Hylton Dene. By Mr. G. L. Brady.—Hylton Dene is a ravine or dell through which flows a tributary to the river Wear. The burn, like the Wear at that point, is subject to tidal influence, but the adjacent pools, of which we have more particularly to speak, are above the level of high water at spring-tides. The proportion of saline constituents in the water of the pools regularly decreases as we recede from the river, the quantities being as follows:—Those of the first group contain 6¼ grs. of chlorides in the ounce = 1·3 per cent.; the second group, 4½ grs. = ·95 per cent.; and the third group, ·84 grs. = ·176 per cent. As regards their organized inhabitants, the pools differ no less conspicuously than in their inorganic constituents. Those of the first and most saline group are marked chiefly by the presence, during the autumn months, in considerable abundance, of two nudibranchiate mollusks—*Alderia modesta* and *Limaprutia depressa*. They contain, also, in common with the second group, various crustacea, *Gammarus locusta*, *Orchestia littorea*, *Palæmon varians*, *Crangon vulgaris*, *Corophium longicorne*, *Sphæronia*, and *Temora velox*, an Entomostracan of the order Copepoda. Besides, these, there are two or three species of *Foraminifera* and some *annelida*, referable to the genus *Nereis*. The second group is characterized more by the absence of certain species which occur in the first and third than by any inhabitants peculiar to itself. The large pool which forms our third division differs in nothing, excepting its peculiar crustacean fauna, from an ordinary fresh-water pond. It affords a home to numerous *notonectæ*, beetles, and water-rats; to a few individuals, small and stunted, of *Limnæus pereger*; and to a beautiful *Polyzoon—Plumatella repens*. The *Entomostraca* of this pool are all purely fresh-water species, such as *Cyclops quadricornis*, *Candona lucens*, and several *Cyprides*. The author remarks especially upon the presence in fresh water of some of the larger crustacea—*Palæmon varians*, *Mysis vulgaris*, and *Corophium longicornus*—all of which occur in great numbers. He says, "I know of no other instance where any of these occur in absolutely fresh water, and their association with such undoubted fresh-water species as those mentioned above seems to me a matter of very great interest. It is strange to see prawns and shrimps gliding among the leaves of *Callitriche*, and overshadowed by blossoming wild-rose and whin. It is remarkable that these crustacea seem to have undergone no deterioration from their residence in fresh water; the specimens taken there are quite as fine as those which we meet with in salt-water localities, except, perhaps, in the case of *Corophium*, which is rather small, and of which there is an unusual preponderance of females. It is curious, also, that although the marine species advance into fresh-water, we do not find the fresh-water species tolerate even a very small admixture of salt; for, except the stickleback, I have never noticed any fresh-water animal in the saline pools. Professor Rupert Jones, in his 'Monograph of the Fossil Estheriæ,' says that some of the fresh-water Entomostraca 'may have been capable of living, at least for considerable periods, in even salt water, for some of the common *cyprides*, such as are abundant in fresh-water streams, are not uncommon in ditches of brackish and even highly saline water in the low grounds near the sea.' I must say that this is quite contrary to my experience; and, at all events, I do not think it can be a thing of common occurrence. I have never met with any of the fresh-water Entomostraca in brackish pools nor have I ever in such situations found any species of *cypris*. The only *ostracoda* which I have taken belonging either to the genus *Cythere* or to the sub-genus *Cyprideis*, which is probably the same thing. The *Corophium* is found inhabiting tubular burrows on a soft muddy or a peaty soil; it is always, so far as I have observed, associated with numbers of annelids; and, though it undoubtedly has the power of burrowing rapidly into the mud, I believe that the tubes in which it is found are really the work of the annelid. And if, as it is asserted, there be such a deadly enmity between the two creatures, it is not at all an impossible circumstance that the *Corophium*, after demolishing the unfortunate annelid, may add insult to the injury by taking possession of its burrow. The constant presence of *Corophium* in localities of this kind would seem to contradict the assertion of M. Quatrefages, 'that at about the end of April they come from the open sea in myriads to wage war with the annelids, which they entirely destroy before the end of May; they then attack the mollusca and fish all through the summer, and disappear in a single night about the end of October, and return again the following year.' Estuary-swamps, such as those we have just noticed, seem to be the nearest analogues we now possess of those extensive lagoons which, during the carboniferous period, supported the rank vegetable growths now fossilized in our coal-measures. To the palæontologist it must be a matter of considerable interest to note the association of species in such localities, and I think enough has been said to show that considerable caution should be used in pronouncing upon the saline or fresh-water nature of any deposits merely from the nature of the animal forms which they enclose. Judging from analogy, however (if our own island may be taken as a type), we should suppose that any great luxuriance of vegetable growth must be indicative of fresh-water conditions. We uniformly find in the saline portions of these marshes a peculiarly dwarfed and stunted vegetation; while, as we recede from the salt-water influence, it often assumes quite a rank luxuriance, putting on a character quite as much in accordance with the vegetation of the coal-period as can be expected in these degenerate days."

On the Marine Cyclopoid Entomostraca (Calanidæ), with Notices of some Species new to Britain. By Mr. G. S. Brady.—Dr. Baird's Monograph of the British *Entomostraca*, published by the Ray Society in 1849, and still the only authoritative work on the British species, contains descriptions of only three species of this family:—viz., *Cetochilus septentrionalis*, *Anonialocesa Patersonii*, and *Temora Finmarchica*, the last of which seems to be involved in some obscurity. Mr. Lubbock has, however, since that date given descriptions in the "Annals and Magazine of Natural History" of several new British species. The whole of the material which the author has yet been able to obtain has yielded altogether nine species, four of which are new to Britain. The best specific characters will be found in the form and structure of the antennæ and the fifth pair of feet, and in the shape of the last abdominal segments: there are minor characters discernible also in other organs. One of the most curious points of structure is the strong serrated amiature existing in many species on each side of the hinge-joint in the right antenna of the male. This, with the remarkable diversity in the form of the fifth pair of feet, will be plainly seen in the drawings. The four species referred to as being new to Britain are *Ichthyophorba mamata*, *Dias longiremis*, *Temora velox*, and a species of *Euchata* (?) not yet determined. It is interesting to notice that *Temora velox*, a marine species taken by Mr. Norman at Cumbrae, was found in this district—not as a marine species, but in brackish water at Hylton Dene. The most abundant species both in the Shetland and Northumberland gatherings, and occurring plentifully also among the Channel Islands, was *Diaptomus longicaudatus*, Lubbock. This is especially abundant in this district as a littoral species. It may also be noticed, as being of common occurrence here and in Shetland, *Evadne polyphemoriles*, Leuckart — a species hitherto unrecorded as British. Though found in company with the cyclopoid species, it belongs to the family *Polyphemidæ*, and does not therefore come within the range of the present paper. *Temora Finmarchica* is included on the strength of one mutilated specimen, which, however, agreed so well with Dr. Baird's figures as to leave little or no doubt about its identity.

On the Colour of Salmon. By Dr. Davy.—The conclusion that the author is disposed to come to is, that the salmon-colour is unconnected with oil or fatty matter, and that it belongs to the coloured muscles after the analogy of the colouring of the muscles of various other animals, as witnessed in the instances which come under our observation in the way of meats. In beef, mutton, venison, the hare of proper age, how dark is the muscular fibre. The same colour is seen in the goose, and still more strikingly in the swan, and in most wild birds, and also in certain fishes, especially of the tunny family. The results of the few chemical experiments made seem to favour the same conclusion.

Granting that the colour belongs to the muscular fibre—*i.e.*, that the colouring matter is seated in the muscle irrespectively of fat—the further conclusion submitted is, that it is of an organized kind; it may be a peculiar colouring matter, nowise essential to the muscle (some of the muscles being without this colour) and analogous to those colouring matters which exist in plants, especially their leaves and flowers, and in the tegumentary parts of mammalia, birds, and fishes, such as the hair of the first, the feather of the second, and the epidermis of the third.

Descriptions of new British Polyzoa, with remarks upon some imperfectly known species. By Mr. J. Alder.—The species forming the subject of this communication belong chiefly to the branched calcareous forms of the genera *Cellepora* and *Eschara*. The new species described were named *Cellepora lævigata*, *Eschara ligulata*, and *Palmicellaria elegans*, the latter also a new genus, proposed for a beautiful little coral, dredged this year in Shetland by the Rev. A. M. Norman. The species remarked upon included the *Eschara lævis* of Fleming, a species lost sight of by British naturalists for many years; *Eschara Landsborovii*, now first ascertained to be an *Eschara*, but the imperfect state of which had been described by Dr. Johnston as a *Lepralia*; this was found on the coast of Northumberland by Mr. Embleton; *Quadricellaria gracilis*, of Sars, previously described from an imperfect specimen under the

name of *Onchopora borealis*, by Professor Busk; *Scrupocellaria Delilii*, a species new to Britain, got on the Northumberland coast; and *Hornera borealis*, Busk, now introduced as British for the first time.

Notes on Foraminifera new to the British Fauna. By Henry B. Brady, F.L.S.—After some preliminary remarks on the various methods of separating recent *foraminifera* from bulky material, the author proceeded to read notes upon the following forms not hitherto recorded as British, which had, with one exception, resulted from the examination of sands dredged by Mr. Gwyn Jeffreys and Mr. Waller round the Shetland Islands — the exceptional case, *Pulvinulina Menardii*, D'O., having been found in soundings from the Irish Sea:—

Biloculina sphæra, D'O.; *Biloculina contraria*, D'O.; *Triloculina tricarinata*, D'O.; *Quinqueloculina pulchella*, D'O.; *Lituola scorpiurus*, Montfort; *Lagena distoma*, P. and J.; *Glandulina lævigata*, D'O.; *Bigenerina digitata*, D'O.; *Bolivina punctata*, D'O.; *Planorbulina Haidingerii*, D'O.; *Planorbulina Ungeriana*, D'O.; *Pulvinulina concentrica*, P. and J.; *Pulvinulina Karsteni*, R.; *Rotalia orbicularis*, D'O.; *Discorbina Berchelotiana*, D'O.; *Anomalina coronata*, P. and J.; *Polystomella crispa, var. arctica*, P. and J.; *Nonionina stellifera*, D'O.; and *Pulvinulina Menardii*, D'O.

Sub-Section D.

Observations on the Eggs of Birds. By Dr. Davy.—The author, after pointing out certain qualities of resemblance common to the eggs of different kinds of birds—such as, especially, the alkaline nature of the albumen, and the acid of the yolk, and that the two are in opposite electrical conditions—described the results of the experiments he had made to endeavour to ascertain in what respects the eggs of different species differ. His results seem to warrant the following conclusions: 1. The colouring matter of the shell is organic, and similar to that of leaves and flowers, and in part depends on molecular arrangements. 2. The albumen in quantity greatly exceeds the yolk, but in eggs of different species in no regular manner, whilst, in all, the quantity of solid matter in the yolk is proportionally much larger than in the white. 3. The temperature at which the coagulation of the albumen takes place varies in almost every instance, and the firmness of the coagulum does not appear to be regulated by the proportion of solid matter which the albumen yields in evaporation. 4. The coagulum of each has an aspect of its own, varying in different instances as to tint and degree of translucency, and in some varying in colour.

On the Ventilation of Barracks and other Public Buildings in India. By Mr. Stewart Clark.—A number of plates accompanying the paper exhibited the plan of a barrack 70 feet by 20, arranged with twenty beds, ventilated by forced ventilation, with sections and elevations of the whole apparatus, which the author had reason to believe was well adapted to the ventilation of soldiers' barracks and other public buildings in hot climates. The whole apparatus is of the most simple kind—it can be erected and kept in perfect working order by any ordinary joiner. The apparatus now in use at the Agra Prison was erected entirely by the prisoners. The first one was constructed for a corridor of sixty-eight cells, and cost about £24, including the cost of the convict-labour at the usual rates. Eight men are required to work each blower during twenty-four hours.

The President, in approving the subject of the paper, stated that the mortality in the barracks of India was perfectly monstrous; for, while in England the rate of mortality among the middle classes was only 20 per thousand, that in the Indian barracks was 270 per thousand!

On the Investigation of Instinctive Actions. By D. W. Murray.—Among the conclusions arrived at by the author were that the instinctive movements of animals, and their nerves or physical construction, did not differ from those of man in kind, but in degree. In man the volitional, as representing reason and experience, is immensely superior to the others. As we descend in the scale we find the emotional, as the originator of the purely and really instinctive movements, become more prominent, and generally carrying the will with it, for we very seldom see an animal going contrary to his instincts. Lower still we find all the arts necessary to the life of the animal left to the care and control of reflex action. The author concludes that the amount of intelligence possessed by animals may be judged of by the extent to which it controls the emotional or purely instinctive part of their actions.

Section E.

On the Commixture of the Races of Man as affecting the Progress of Civilization. By Mr. J. Crawfurd, F.R.S.—It was not until the discovery of a new world that races of man of strikingly contrasted qualities came to intermix. In the western world, the intermixture of nations which followed the conquests—first of the Romans, and afterwards of the northern nations—was a union of races of equal quality; and hence it cannot be predicated that either improvement or deterioration was the result. Very different was the case in the eastern world. There Greeks, Romans, and Goths intermingled with races greatly inferior to themselves—such as Egyptians and Syrians—and hence the deterioration to which, in a great measure, must be ascribed that decline in civilization which ended in the downfall of the Roman power. Nature has endowed the various races of man with widely different qualities, bodily and mental, much in the same way as it has done with several closely allied species of the lower animals. When the qualities of different races of man are equal, no detriment results from their union. The mongrel French and English are equal to the pure breeds of Germany and Scandinavia. When, on the other hand, they are unequal, deterioration of the higher race is the inevitable result. When the disparity of races is extreme, no amalgamation at all takes place, for an antipathy is the result, somewhat similar to that which prevents admixture between closely allied species of the lower animals in the wild state. The Hottentots, the Caffres, and the Negroes of Southern Africa have lived immemorially side by side without crossing. The author then remarked that the antipathy of race is presented in the greatest intensity and on the largest scale in the new world, the highest and lowest types of man being there brought face to face. The author then alluded to the laws of several of the American states with regard to Negroes, and stated his opinion that it is the presence of this African race, too prone to live and labour in slavery or in social degradation, and utterly incapable of rising to an equality with the higher race among whom it has been planted, that has caused the present distracted state of the North-American continent.

Professor Wilson of Toronto said that, in the case of the negro the subject was surrounded by many social difficulties—not so, however, in the case of the red man. The vast population possessing English and Indian blood in their veins—such, for instance, as is found on the Red River settlement—possessed physical qualities of a high order. Assuming that the Red Indian was an inferior race, and the Anglo-Saxon one of the highest types of man, the instance he had given would go to prove that the mixture of inferior and superior races did not cause either the one or the other to deteriorate.

On Anthropological Classification. By Dr. James Hunt, F.S.A., President of the Anthropological Society of London.—After the author had given a short outline of the nature of the subject, in which he distinctly stated that the origin of man belongs entirely to mythical times, and is a question which could not be solved by human experience, he proposed merely to classify man as he now exists, or as he has existed since the historical period, without reference to those distinctions being absolutely original. It may therefore be true that some of the popular interest may be taken away from systems of classification. It was Dr. Hunt's duty to inquire—Were these well-defined differences in mankind at the earliest dawn of history? a question which he answered in the affirmative, as the ethnology of the most anciently known continents is very much the same as at the present day. He considered also that these differences had been permanent; and the scope of the present paper was to inquire whether these physical differences were so well marked as to serve as the basis of classification. He reviewed the classifications of Ephorus of Cuma, Buffon, Linnæus, Gmelin, Herder, Voltaire, Blumenbach, Lacépède, Duméril, Maltebrun, Cuvier, Virey, Hunter, Lawrence, Metzan, Bory, Desmoulins, Prichard, Lesson, Fischer, Morton, Latham, Hombron, Jacquinot, D'Omalius D'Halloy, Pickering, Burke, Knox, Agassiz, Crawfurd, and Isidore Geoffroy St. Hilaire, and offered critical remarks on each of these systems as a whole. Many of them were of the most arbitrary nature, the offspring of chance human fancy, unaided by the knowledge of any ascertained facts attempting to define the method on which sound anthropological classification might be based. The multiplicity of the systems at present in vogue is a sufficient refutation of the truth of most of them. Dr. Hunt considered that anatomy and physiology were the primary sources whence an adequate knowledge of the principles of anthropological classification could be derived. Language is no test of race. He laid great stress upon the form of the cranium as the most convenient and certain distinctive mark, and spoke with great approval of the ternary classification adopted by Gratiolet, who divides mankind into the Frontal (European), Parietal (Mongol), and Occipital (Negro) races—these cranial distinctions being coincident with the mental and moral characters which were solely dependent on man's physical structure. Other secondary physical characters could also be used with advantage; and Dr. Hunt especially alluded to the classifications which might be based upon colour, structure, hair and beard, longevity, diseases, temperaments, odour, entozoa, and other subsidiary points of distinction. The degree of intelligence was the chief character distinguishing man from the inferior animals. If a classifier of the negroes of the West Indies were to use language alone as a criterion, he would classify them under the head of Europeans, with whom their acquired language is identical; their physical characters alone mark them as African. Dr. Hunt considered that language must be utterly discarded as the first principle of Anthropological Classification. He gave a far higher value to religion, and to art, considering language merely as the third element. That there are well-marked physical, mental, and moral distinctions in mankind is as well an ascertained fact as that there are differences in the orang and the chimpanzee. We must, therefore, classify mankind according to the physical and psychological differences which now exist, for the present state of anthropology will not enable us to say how and when these distinctions have originated.

Section F.

On the Vital and Sanitary Statistics of our European Army in India, compared with those of the French Army under like conditions of Climate and Locality. By Dr. James Bird.—The author showed that the mortality of 69·0 per 1000, adopted in the lately published "Sanitary Report for India," was obtained under the insalubrious conditions of locality and climate greatly ameliorated of late years. For the last 26 years, or from 1829 to 1855, the death-rate, inclusive of a considerable period of war, the Cabul massacre, the Scinde and Gwalior campaigns, and the two Sikh wars, was only 44·4 per 1000. For 1817, during the Pindaree war, the mortality per 1000 was 69·0; the average for the next six years of peace being 75·0. In 1824, 1825, and 1826, during the first Burmese war and siege of Bhurtpoor, the mortality rose to 129, 157, and 158 per thousand for these years respectively; and for the next six years of peace fell to an average of 56 per 1000; and for the next eleven years of war, 1839 to 1849 inclusive, the rate vibrated from 47 to 124, during the first Sikh war—being for the eleven years an average of 74 per 1000. In the last six years, 1850 and 1855 inclusive, the average mortality was 37·3 per 1000. By the latest return of the British army in India, exclusive of the late East India Company's troops, it appears that the deaths in India amounted to 35·3 per 1000; and deaths on the passage home caused a further loss of 35·3 per 1000; being, altogether, a decrease of the whole strength of 68·6 per 1000. It was shown that invaliding, even at home, causes a decrease of 32·3 per 1000, while the average death-rate, exclusive of the Horse Artillery, was 14·7; so that this cause of decrement in India is not greatly in excess. In comparing those rates of Indian mortality in the British Army with those of French troops, in their tropical colonies of Martinique, Guadaloupe, Guiana, and Réunion, during ten years—1838-47 inclusive—the mortality was 69·5 per 1000—vibrating between 90·4 and 25·3. In Algeria, in an effective strength of 108,000 men, for ten years, from 1837 to 1846 inclusive, the death-rate was 78·8 per 1000; and that during 1846 it was 68·8, while the other casualties of discharged, sent to France, killed in battle, deaths in French hospitals, pensioned, and invalided, amounted to 28·3, increasing the total decrements of French troops in Algeria to 97·1 per 1000. The author also showed that, whereas at home, for fifteen years previous to 1854, the average death-rate was 14·7, and that of invalids 32·1 per 1000, those rates respectively in 1860 had fallen to 7·32 and 21·30, evidently a gain to the effective force of 18·38 per 1000. In the hot climates of Jamaica, Ceylon, and Mauritius, where, from January 1830 to March 1837, the death-rates respectively were 91·49 and 34·6, they had fallen in 1860 to 20·2,

19·6, and 23·8 per 1000, proving beyond doubt that, with the introduction into India of improved sanitary appliances, adapted to climate and localities, and with restraints on vice and intemperance, correspondingly decreasing rates of augmented health among our troops must follow as natural results. The author, in conclusion, referred to Miss Nightingale's evidence, recorded in the Topographical and Statistical Reports, printed in the Appendix to the Sanitary Commissioners' Report of 1863.

On the Decrease of the Agricultural Population of England. A.D. 1851—1861. By Mr. Purdy.—The author draws attention to the prosperity which of late years has attended English farming, and to the rise in the value of land, especially since 1853. At the last census it was found that the only countries which had decreased in population were the agricultural ones of Cambridge, Norfolk, Suffolk, Wilts, and Rutland. To exhibit this decrease the author divides the kingdom into three sections—(1) 24 counties where upwards of 20 per cent. of the adult population is occupied in agriculture; (2) 16 counties where over 10 and under 20 per cent. is employed; and (3) 5 counties where less than 10 per cent. is employed. Between 1831 and 1861 the first section had increased 22 per cent. in the population generally; the second section 39 per cent.; and the third section 73 per cent. In 1831 the population was pretty equally divided between the three sections—the respective proportions were then 5·0, 4·2, and 4·7. In 1861, however, in consequence of the unequal rate of increase, these ratios became 6·1, 5·9, and 8·1. In 1851 the number of persons in England and Wales, under 20 years and upwards, occupied in agriculture was 1,576,080; in 1861 the same class had fallen to 1,531,275. This shows an actual decrease of 44,790 persons, or nearly 3 per cent. in the ten years. The greatest decline had taken place in the south-western and the Welsh divisions. In the former, consisting of the counties of Wilts, Dorset, Devon, Cornwall, and Somerset, the decrease was 20,381, or 9 per cent.; and in the latter, which includes Monmouthshire, it was 13,285, or 8 per cent. The ratio of adults engaged in agriculture in England and Wales on the adult population generally in 1851 was 16·1 per cent., and in 1861 it was 13·9 per cent., which was therefore a decline of 2·2 per cent.; in other words, 22 in every 1000 of the adult population had, between 1851 and 1861, ceased to belong to the agricultural class. Mr. Purdy showed that, during the last decade, the falling off in certain counties was very considerable—Sussex had lost 2698, Hants 3412, Berks 1158, Herts 1095, Bucks 1048, Suffolk 3306, Wilts 2837, Dorset 1343, Devon 9475, Cornwall 3917, Somerset 2809, Gloucester 1166, Northumberland 1265, Cumberland 2099, Monmouth 1089, South Wales 4530, and North Wales 7666.

The highest per centages of decrement took place—in Devon 13·3, North Wales 11·0, Cornwall 10·5, Hampshire 8·8, Cumberland 7·7, Monmouth 7·6, Wilts 7·3, Sussex 6·5, Suffolk 6·4, Dorset 5·6, South Wales 5·6, Hunts 5·4, Bucks 5·1, and Northumberland 5·1. It was observed of Wiltshire, that, while the population generally had decreased by 4904, the decrease of the adult agricultural population was 2837, and that in Suffolk the general decrease was only 747, while the agricultural decrease was 3306. Mr. Purdy stated, however, that eleven counties had increased their agricultural population. The six most remarkable instances were these: Salop had increased 1226 or 3·5 per cent., Worcester 1281 or 5·7, Leicester 1371 or 6·0, Lincoln 2139 or 3·3, Chester 1550 or 4·2, and Lancaster 5336 or 7·1 per cent.

Attention was directed to the fact that the largest increase had occurred in our great manufacturing county, and, further, that Lancashire in 1861 employed a larger agricultural population than any other county. The number of adults so engaged was 80,222. The West Riding of Yorkshire, which in this respect comes next, only employed 77,168, and Lincoln, a purely agricultural county, 67,357. Though the adult agricultural population of Lincoln is 11,000 less than Lancashire, the return of the farmer's profits (schedule B.) in 1859-60 in the former county exceeded those of the latter by £1,000,000. The valuation in both counties having been made upon precisely the same principle—that is, by assessing all the farms, whether their occupiers were liable to pay income-tax or not. In 1851 there were in Lincolnshire 10,970 farms—one-fourth of the number exceeded 100 acres each; while in Lancashire, with 15,365 farms, less than one-twentieth of them exceeded 100 acres each. Excluding from each county those persons placed under the agricultural class, but who, in fact, work in woods or in gardens, it is found that in Lincolnshire there were 65,849, and in Lancashire 76,496 adults engaged in agriculture, properly so called. The schedule B. valuation of the first county is £2,647,000, and of the second £1,605,000. Dividing these sums among the adults respectively employed in each gives £38 per head for Lincolnshire and £21 for Lancashire. The exact relation between the agricultural capacity of the two counties can only be satisfactorily shown when England adopts a system of agricultural statistics like that of Ireland.

The diminution of the agricultural population was attributed to emigration and to the attraction of higher wages in other industries; though a considerable advance had taken place of late years in the money wages of the farm-labourer. In Wales, where a large decrease of the agricultural class has been noted, the men's wages had risen from 7s. 6d. in 1837 to 11s. in 1860. Contemporaneously with the general advance of agricultural wages, large tracts of waste land had been enclosed for cultivation. The Enclosure Commissioners state the total area to be 390,000 acres; this is equal in extent to the whole county of Hertford.

The writer concluded by remarking that the want of agricultural statistics in England precluded any investigation of the effect which the decrease of manual labour may have had upon the productiveness of the soil; how far increase of skill and mechanical appliances have supplied the place of the labourer; what and how much did England yield when 1,576,000 of her adults belonged to the agricultural class, what and how much, ten years later, when the class was reduced by 45,000 persons. These are questions of great interest, but which, at present, cannot be solved statistically.

Mr. Fawcett said he did not regard the decrease of the population as at all alarming; on the contrary, he looked upon it as one of the most encouraging results of the last census.

Section G.

On Richard's Steam Indicator. By Mr. C. T. Porter.—It is impossible to describe this instrument without a diagram. It is sufficient to say that its arrangements were ingenious, simple, and practical; getting rid of the principal well-known defects of the ordinary indicator.

A discussion ensued, in which Professor J. Thompson, Messrs. Oldham, Robt. Mallet, and J. F. Spencer took part—all of whom expressed themselves in favour of the instrument.

On Air-Engines and Air-compressing Apparatus. By Mr. J. Jamieson.—The air-arrangements of this engine can only be described by means of diagrams. It may be sufficient to state that experimental engines have been made which give great promise of success. Messrs. Jamieson are now erecting an engine on this principle to drive their factory now in the course of erection. The advantages to be derived from these engines are stated to be a saving of fuel, freedom from risk of explosion, the engine not liable to derangement, insurance is not affected, and the compressed air may be applied in any situation, being laid on like gas. Power in this way might be supplied to a whole town at small expense.

On a New Method of Working Railways by Stationary Engines. By Messrs. R. and W. Hawthorn.—Messrs. Hawthorn propose with the ordinary construction and gauge of railway to place in the intermediate space between a double line of rails a series of double-grooved sheaves, fixed in spindles or axles, which pass across under the rails, extending a little over the centre of each line; a plain wheel or roller is fixed upon each end of these axles by which the motion is communicated to the train, from a stationary engine or engines placed at a convenient point of the line, by the means of an endless wire or other rope, passing alternately over and under the grooved sheaves to the extremity of a section of the line, where it is taken round a large loop-sheave and returned to the engine, now passing over each sheave which it before passed under, and *vice versâ*—the double groove providing for the rope crossing itself without contact. Having traversed twice along the line of sheaves, the rope goes again on to the large winding sheave of the engine, on which a sufficient number of turns are taken to ensure the requisite friction. From this arrangement of the rope on the sheaves, it will be seen that every alternate sheave runs in the same direction, and every intermediate sheave in the contrary direction; and this motion is communicated to the traction wheels or rollers before-mentioned. It is proposed to construct the carriages for passenger lines on the principle of those used in America and on the Canadian railways, of a length of from 60 to 75 feet, and supported on bogies, and capable of seating from 120 to 150 passengers, each carriage to be fitted with traction bars—these bars extending over two or more alternate traction rollers—and to be furnished with the ordinary flanged wheels for running on the rails. The traction bars, of which there are two, are placed side by side, at such a distance from each other as may be necessary to meet the requirements of the line; and these traction bars are worked either in connexion with, or independent of each other, by a suitable arrangement of levers or other gearing, by which either of the bars can be raised or depressed, thereby bringing a portion of the weight of the carriages upon the traction wheels or rollers, thus giving motion to the train of carriages in either direction; or both these bars can be raised out of contact with the traction wheels or rollers, and the train left free from all tractive force. The traction bars will be nearly the full length of the carriage, and the traction rollers will be placed about 18 feet apart, or at the rate of 293 per mile. The carriage made in this way is adapted for running with either end first, being provided at each end with a platform, on which the driver stands to work the traction bars; and it is considered that, for ordinary traffic, one carriage will be sufficient to form a train; but two or more may be attached to each other, or the number of trains of a single carriage each may be increased to meet the requirements of the traffic. The motion of the train can be quickly and certainly retarded or stopped by raising one bar and depressing the other, in the manner of a brake, thereby reversing the direction of the driving motion. A separate or independent traction carriage may be used, fitted with the traction bars and gear; but it is considered that such an arrangement would, in most cases, only be adding a useless and unnecessary weight to the useful portion of the train. The present line of underground railway through London, from Paddington to Farringdon Street, is favourable to the use of the locomotive engine, where so much of the surface of the ground under which it passes is unoccupied by buildings, and readily admits of a good deal of open cutting and ventilation at the stations, which cannot be the case where the railway passes under the densely-populated parts of a city, as those projected in London must do. In such cases it will be necessary to provide for working in a continuous tunnel of perhaps three or four miles in length, in which the steam and smoke of locomotive engines would prove obnoxious to a much greater extent than is experienced on the present line, which is only partially an underground railway. As there does not appear to be any means of remedying these evils, except at a very extravagant cost, it is believed that the new system may be introduced with advantage in such cases as are above referred to—viz., railways passing under large towns or in situations where opportunities do not occur of having openings to the surface. The maintenance of the engines will be considerably less than with locomotives, to balance the expense of keeping in working order the sheaves, ropes, &c., which will cost more than an ordinary line. Both calculation and experiment on the adhesion acquired to propel a train remove any reasonable doubt of being able, by the new system, to obtain sufficient tractive force by the traction bars and rollers, and it is evidently quite feasible to increase this tractive force if required.

A New Method of Constructing Boats. By Mr. Geo. Fawcus of North Shields.—The National Lifeboat Institution has done much to promote and encourage the preservation of life from shipwreck. The useful services of the lifeboats are limited to certain localities. After every due compliance with the requirements of the legislature, intended to provide every passenger-vessel from our shores with its own lifeboat, a passenger-vessel may yet be provided very inadequately with boats. A ship's boats are very liable to be injured, and, when very large or heavy, are difficult to launch, and in moments of danger and confusion the difficulty is increased. With the proposed plan of boats, a passenger, emigrant, or troop-ship may easily carry sufficient boats for landing all on board at once, without more (perhaps with less) encroachment on the limited space on deck; and her boats, when packed as proposed, will mutually strengthen and protect each other from injury. The use of a large number of smaller or medium sized boats which may thus be adopted will lessen the difficulty of launching; and then there will be less confusion by these boats being free from lumber, more promptly loaded and despatched from the ship's side, a place of danger in bad weather, with the passengers more divided. There

will then be less danger of rushing to the best or first boat, when everyone on board is satisfied that there is room enough in the boats for all, and that all are equally good.

The boats are so constructed that any number will fit one within the other, as internal projections are dispensed with and thwarts folded. Flat, half-round, or angle iron or iron plates are used to impart the necessary strength. Although the inventor prefers to form the boat with two bows, they may yet be made with a bow and stern. These boats are, moreover, admirably adapted for pontoon purposes, as the displacement of each boat is equal to that of a pontoon; and half-a-dozen boats, with the displacement of six pontoons, may be packed in the space of one pontoon.

On a New Plan for Hanging Dock-gates. By Mr. R. A. Peacock.—In this paper the author passes under review the inconveniences incident to the present system of dock-gates, and describes his plan, by which these inconveniences, he states, are got over, and hydraulic power rendered unnecessary.

On Thompson's Universal Stopper for Bottles, Casks, &c. By Mr. D. Puseley.—Mr. Puseley described an extremely ingenious and effective mechanical arrangement for closing bottles, jars, casks, &c., and illustrated his descriptions by specimens of the various vessels to which it is applicable. Without diagrams or the articles themselves it is impossible to render the invention intelligible to our readers. Mr. Thompson has erected machinery, by means of which these stoppers can be supplied as cheaply as corks; and, moreover, the same stopper can be used repeatedly, whilst corks are generally destroyed by once using. Messrs. Austins of Newcastle, large makers of glass bottles, are applying this feature to a considerable extent in their trade.

ART.

MORE ABOUT ART IN PARIS.

THERE is no disputing the fact that an Englishman arriving in Paris from London finds himself transported from a centre of commerce and manufactures to a centre of art. The art which has resulted in the almost complete reconstruction of Paris may be objected to on certain grounds of taste, and particular public buildings in London may be instanced as more perfect embodiments of the laws of good architecture; but the art which meets the eye of the stranger in modern Paris, in architecture, in painting, and in sculpture, is everywhere French, and is the expression of a truly national taste.

The work is still going on. Not only within the fortifications of the city, but beyond the barriers, hordes of workmen are employed in the work of demolition and rebuilding. Long lines of waggons, laden with single blocks of the soft white stone with which the pure atmosphere of Paris deals so kindly, are slowly being dragged, each by its picturesque team of white horses, to the various destinations where the builders are at work. Historical Paris may be almost said to exist no more; and, after the lapse of another ten years, a Parisian will be able to do little more than indicate to a stranger the sites of present historical remains. Side by side with this almost universal reconstruction, progresses also the restoration of the public edifices of the city. With truth to the letter, but often not to the spirit of the old builders, the Gothic churches have been restored stone by stone. The great outlines generally remain; but the life that was in the old details will in vain be sought for in the newly-carved stones. The new gargoyles of Notre-Dame have no mediæval quaintness, and the wooden *flèche* which has been added, even if justified by the original plan of the builder, is strikingly ugly, and apparently misplaced.

As with the churches, so with the palaces—the Tuileries, the Louvre, the Luxembourg, the Palais de Justice, the Hotel de Ville—everywhere Imperial revenues are spent in the work of restoration and decoration; and the wealth of gilding displayed in the *salons* of the Tuileries or the Luxembourg rivals the luxury of riches which brought Attila and his followers to the ancient West. To the stranger the inquiry is constantly suggested, by what means all that he sees has been accomplished. If he puts such an inquiry to a Frenchman, he probably shrugs his shoulders, and replies that too much has already been done, and that it has been done too fast; that he is taxed above his strength, and that his city, from one of the cheapest capitals in Europe, has become the dearest. The resident Englishman will probably tell him that money has been wisely borrowed and safely invested by the municipality, that property has become more valuable, that wealth has increased, and that the general well-being has infinitely improved; and, if he be enamoured of the present government, he will point to modern Paris as a splendid instance of the advantages of centralization. Both answers are probably true; but the stranger, if he be an Englishman, will be satisfied with neither. He will feel that, in proportion to the means available and actually expended upon the embellishment of his own capital, there is infinite waste and misuse, and nothing to speak of accomplished; and he will also be loth to admit that the system of local self-government upon which he prides himself must necessarily subject him to the distinction of living in the ugliest capital in Europe. It would be a mistake to suppose, however, that the transformation which everywhere meets the eye is government work. In Paris itself the action was first taken by the municipality on government inspiration, and to a great extent probably by means of imperial resources. But private speculation has also been largely at work. All the suburbs of Paris are being rapidly converted into wealthy centres of society. The erection of suburban villas, within a radius of ten miles outside the fortifications, bears striking evidence of the increasing wealth of Paris. Land that men now living can remember shooting over is now covered with houses, which, as with us, are occupied as soon as they are completed. Villas are surrounded by pretty English-looking gardens; and the prevalence of an air of neatness and comfort cannot fail to strike the visitor, whose memory bears the impression made upon it by the contrast which existed twenty years since.

This newly-found neatness and order, applied as it now is to the landscape-gardening of Paris and its neighbourhood, is likely to be particularly noted by an Englishman. The art of landscape-gardening, we have been accustomed to think, belonged more particularly to ourselves. The French have borrowed it from us, and bid fair to distance us in their application of it to the adornment of their capital. Applying their quick intelligence and innate taste to the improvement of their parks, or to the construction of new ones, they have converted the Bois de Boulogne into one of the most delightful suburban parks in Europe, and have created the new park of Monceaux. They have also converted every spot of vacant ground into a pleasant garden, and vastly improved the appearance of those which already existed. Artificial embankments of flowers, well-mown turf, and neat borders now characterize the public gardens, quite as much as fountains and avenues formerly did.

These changes in the aspect of Paris can hardly have been accomplished without much inconvenience and perhaps suffering to the poor. A stranger will certainly wonder where the poorer classes are now to be found. The poorest class, certainly, does not present itself to his eye; and the hard-working, honest poor of Paris have none of that appearance of squalor and misery so noticeable in the back streets of our own capital. The clean white caps of the women of Paris contrast favourably with the old battered bonnets of the women of London, as also do the cheap blouses of the French labouring men with the ragged cast-off clothes of our distressed operatives. There certainly may be the reality, without the appearance, of so much distress as with us. A costume, even though it be but a cap or a blouse, has a certain attraction for the eye of an artist, and appears to him to indicate a certain art-feeling, unconsciously directing the taste of the people; but it is also probably a real value, and dignifies poverty with a kind of self-respect which would be humiliated by the offer of an old bonnet or an old dress coat. There is said to be a great deal of misery in Paris, as there undoubtedly is in London; but its aspect is not visible. The general impression made upon the mind by a walk through Paris is, that the arts have been encouraged to an extent unexampled in modern times, among a people capable of appreciating and ready to enjoy the advantages that result from their civilizing influences. Paris, however, does not stand alone in France as a city that has been improved at the expense of the other great cities of France. Everywhere the same process is going on. While monuments are carefully preserved, and sometimes almost rebuilt, the old streets that are sometimes coeval with them are ruthlessly swept away. Rouen, which within our recollection has existed almost unchanged as the ancient capital of the Dukes of Normandy, will shortly be hardly recognised as a Norman town at all. Right through the centre of it, and close to the old Tour d'Horloge, drives a brand new Avenue de l'Impératrice. While it makes an artist shudder, it certainly lets daylight into the rotten old place. We loved to stroll in the old streets, and never wearied of looking at the picturesque houses which seemed to unite the present with the past; but we preferred to sleep at one of the new hotels on the Quai, and to leave the past and its smells to the picturesque inhabitants who were not endowed with the like sensibility to appreciate them.

It is, as we know, a subject of regret to many that the old Paris should so completely have passed away. They find none of its history in its new boulevards, and like not its freshly restored monuments. But, after all, the change must come. Usually the process is a more gradual one; and the life of one generation has not hitherto sufficed to reconstruct a city. Whether in this case the process has been directed in the wisest way, whether the building of splendid streets and houses means more room for the rich and less for the poor, whether it was judicious to raise Paris to the pre-eminence of being at once the dearest as well as the most splendid of European capitals—are questions which may be fairly discussed; but that the changes have been directed and executed in an artistic spirit, and that even now many of them are signal instances of wise provision, cannot be denied. The tower of St. Jacques de la Bourcherie, which a few years since stood in the midst of narrow and filthy, though picturesque historical slums, is now opened up to daylight by the Rue de Rivoli; and, in place of reeking gutters, it is surrounded by a pretty garden, in which women are working and children are playing. Such are the changes that have been made in Paris throughout; and we certainly find it hard fairly to disapprove of them.

There is no evidence, as we think, that all that has been done is merely the result of an Imperial will, as there is in the still unnecessary streets at Munich, that were built by the late king. There is no sign of overbuilding in Paris, no lack of inhabitants in any quarter of it. Their new city is being rapidly turned into a new hive for a gay and lively, but also for a seriously industrious, and highly-gifted people.

Something, and that a great thing, and surrounded by difficulties, remains to be done before Paris can claim the full credit of its improvements. It is reported that, in an interview granted by the Emperor to a free-spoken Englishman, his Majesty asked him what he thought of the modern improvements. The reply was, "Sire, it was the boast of Augustus that he found Rome of brick and left it of marble; but greater honour will be your Majesty's due, if you shall be able to say, 'I found Paris stinking, and I left it sweet.'" The drainage of the city has yet to be done; and it is said that it will be commenced immediately on the completion of the works now in progress.

ART NOTES.

How to have a statue raised to one's memory has found a practical solution in the will of the late Mr. J. W. Gilbart, late general manager of the London and Westminster Bank, where the sum of £3000 is apportioned by the testator for this mark of posthumous honour to himself. The statue is already in hand, and will be placed in Norwood Cemetery when completed.

THE Arundel Society have received a drawing, by M. Schultz, of the celebrated triptich by Memling, preserved in the Hospital of St. John, Bruges, the central compartment of which represents the Adoration of the Magi, and the two wings of which are filled with the Adoration of the Virgin, and the Presentation in the Temple on the interior, and with St. John the Baptist and St. Veronica on the exterior. The Society will issue a chromo-lithograph of this drawing to its members.

THE memorial statue erected to the late Earl of Fortescue, Lord-Lieutenant of Devonshire, placed in the Castle Yard, Exeter, is the production of Mr. E. B. Stephens, and is executed in Sicilian marble. It is eight feet high, and is placed upon a granite base of the same height, the entire height of the monument being sixteen feet.

THERE is to be an International Art Exhibition at Vienna in 1864, to open on the 15th of April and to close on the 31st of May; and works of art will be received only from the 15th of March to the 1st of April, and must be sent by the artists themselves. There will be eleven prizes, but only Austrians can receive them. They consist of three gold medals, seven prizes of 315 gulden, and one prize of 840 gulden.

THE French papers are still full of traits of Delacroix, at whose funeral, be it observed by the way, a shamefully small number (hardly 200 persons) assisted. About ten years ago the great artist was told of a Rubens in some gallery till then unknown to him. He saw the picture, and was so struck with its beauty that he forthwith asked to be allowed to copy it; and, old man as he was, he sat indefatigably for more than a month before the canvas, until he had, with his own hands, finished the hard student's work. *Per aspera!*

THE central committee for the German National Körner Festival has, by the advice of King Ludwig of Bavaria, decided to erect the proposed monument for the poet-hero—lyre and sword of silver in colossal dimensions—in the Germanic Museum at Nürnberg, instead of the Walhalla, near Ratisbon, as first proposed. The Germanic Museum has now issued a formal request to all those who may have any *souvenirs*—arms, letters, &c.—of Körner in their possession to entrust the same to the safe keeping of the Museum, either as national property or as a loan.

A. BECK, the painter, of Düsseldorf, has for the last twelve months been busy with the preparation of a great national "Gedenkblatt," representing the details of the battle of Leipsic, and which will be not only the finest, but also the largest of all woodcuts hitherto executed in Germany. The single drawings will be as follows:—1. A central plate: View of the Battle-field from the Monarchs' Hill. The monarchs receive the news from Schwarzenberg that the French are in full retreat. In the midst the village of Probstheida in flames. 2. Napoleon's place during the battle near the Quandtmill. 3. The Battle of Möckern. 4. Meerfeld captured near the Mill of Dölitz. 5. Monument on the Monarchs' Hill. 6. The taking of the Castle of Dölitz. 7. Paunsdorf. 8. Napoleon's leave from the Saxon guard. 9. Kleist in Probstheida. 10. Poniatowski's death. 11. Napoleon in the crush of the Rannstedt Road. 12. Flight of the French over the bridge near Lindenau. 13. The blown-up bridge near the Funkenburg. 14. Hurrah to Father Blücher! (Scene in the market-place.) 15. The last carnage on the Fleischerplatz. 16. Entry of Emperor Francis through the Grimma Gate. 17. Wounding of the Prince of Homburg. 18. The Swedes in the Grimma Suburb. 19. Fight near the Lössnitz (last night-quarters of Poniatowski). The *ensemble* is said to be as strikingly fine as the details are of the most exact accuracy and painstaking minuteness.

MUSIC.

THE WORCESTER FESTIVAL.

OF musical intelligence in London there is now a complete dearth. On the 3rd Mr. Mellon gave a second Mendelssohn night, which was chiefly remarkable for the immense audience collected together; and on the following Saturday a "Volunteer" programme attracted an almost equal number of amateurs. So we fear that Promenade Concerts do not afford the most favourable opportunity for testing the musical education of the public. It is certain, however, that the names of the great composers do attract large masses of people to listen to their works; and those who listen long enough will certainly like at last. Those who begin by studying as a matter of duty will study at length for their own delight. On the morning after the "Volunteer" night all the principal members of Mr. Mellon's orchestra left London for Worcester; and thither, if we are in quest of music, we must e'en follow them. It is problematical if, when we have arrived in the capital of the cider district, we shall be rewarded for the fatigue of a long journey by any exceptionally brilliant performance; but we shall find much to compensate us for the trouble that we have taken. For instance, the mere vicinity of Malvern is in itself a powerful inducement to visit the Worcester festival. It enhances in no trifling degree one's enjoyment of an oratorio about to be performed to gaze for five minutes from the terrace opposite the great west window of the Cathedral at the picturesque chain of hills (mountains they would be called in Germany) that stand out in black relief or fade away into purple vapour against the autumn sky. Nor is it a small privilege to be able to jump into a railway carriage at the close of an unsatisfactory performance, and be transported in ten minutes to the foot of these same Malvern hills, there to forget all artistic shortcomings in the enjoyment of nature. But one need not go so far for compensation. In the Cathedral itself the thoughtful and unprejudiced listener will find much to console him for many an imperfect presentment of great work. The solemn character of the edifice must infallibly exert a very appreciable influence upon the mind. The absolute decorum observed by the audience (we had almost said the congregation), the hushed tread of the comers-in, and the severe silence, of course unbroken by applause, scrupulously maintained, give the Cathedral performance of an oratorio all the impressiveness of a religious ceremony. But it is in the choir that the peculiar beauty of such a representation is most deeply felt. We should explain that the orchestra is erected at the junction of the nave and side-transepts, and that the audience are assembled in the body of the church. As neither the principal singers nor the conductor, nor, indeed, the orchestra, can be seen from the choir, this part is seldom opened to the public; and even on overcrowded days, when it is thrown open at some very small price of admission, it is but very little frequented, so much curiosity to see is mixed up with the desire to hear. Listened to in this undisturbed quietude, the didactic and undramatic portions of sacred works seem to bear unwonted significance. We have never before been so deeply impressed as we were on Tuesday by the unaccompanied trio and succeeding chorus in "Elijah." In listening to the trio we happily ceased to be critical on the voices of Mdlle. Titiens, Miss Palmer, and Madame Sainton, while the chorus lifted us far above all considerations of good and bad singing. It seemed as though its ethereal melody were gently breathed about the lofty arches by thousands of unseen angels, and as though it penetrated like fragrant incense into the brain. The "Requiem," again, exercised a still more powerful effect, and its terribly solemn strains, coming from some unseen source, struck the hearer with indescribable awe.

By the time these lines are printed the festival will have been all but completed. While they are being written it has hardly commenced, and, as nothing has as yet been given, we will reserve our remarks upon the performances until next week.

MUSICAL NOTES.

IT is now positively asserted that "Les Troyens," the long promised opera of M. Hector Berlioz, will be produced at the Théâtre Lyrique in November. The work is so enormously long that it has been found necessary to cut out the first two acts. M. Meyerbeer, it is hoped, will also speedily bring out his still more anxiously expected "Africaine," now that he has found his heroine. The *maestro* was present at the last of Mdlle. Titiens's performances in Paris, and, it is said, is very much pleased with her.

A HITHERTO unknown opera by Donizetti was found the other day, according to Naples papers, in a long-forgotten cabinet of a musical publisher of that city. It is said to be entitled "Maria Stuarda," and to have been composed for San Carlo, but to have been prohibited from political reasons. Maestro de Giosa intends to bring it upon the stage as soon as he has found a prima donna worthy of the part of the queen.

A NEW musical collection has appeared under the title "Scriptores de Musicâ medii ævi," edited by E. de Coussemaher, which is to form a continuation to that of Gerbert, and of which only two hundred and fifty numbered copies will be issued. The publisher is Durand in Paris.

SCHUMANN-COMPOSITIONS of German songs, together with the text translated into French by Jules Barbier, the author of the Faust-Libretto, are about to appear in Paris at the firm of Flaxland.

THE DRAMA.

"MUCH ADO ABOUT NOTHING," AND "AN AWFUL RISE OF SPIRITS."

MR. WALTER MONTGOMERY'S performance of *Benedick* in Shakespeare's "Much Ado about Nothing," strengthens us in an opinion which we expressed some two or three weeks back as to the comic faculty possessed by this actor. We do not mean to say that his acting of *Benedick* stamps him as a great comedian; but it certainly leaves upon our mind a much more satisfactory impression than any of his tragic parts have left. Throughout the performance we felt that he was playing within the range of his unforced sympathies; in other words, that, while his desire may be to sustain tragic parts, he is by nature, and we suspect by habit, best fitted for comic, or serio-comic, characters. His comely figure and smooth round face are suggestive of mirthfulness; his features, indeed, are almost incapable of sustained tragic expression, as was manifested by his acting of *Shylock*, *Othello*, and *King John*. His voice—made heavy, we take it, by inconsiderate cultivation—is too cumbersome for the delivery of passages of light merriment, but is yet of pleasing quality when not artificially strained, and might be made considerably more flexible than it is at present. As *Benedick* he appears to great advantage; and the spontaneous applause which greeted him several times during the action of the piece had a significance which, we think, he would do well to mark. As far as his present experiment of management is concerned, the production of "Much Ado about Nothing" will do more for the reputation of his theatre than "Othello," "Richard III.," and "The Merchant of Venice" put together. In the acting of those plays his poverty of resources has been painfully evident; while in "Much Ado" he has been able to cast the piece in such a way as to make it noticeable on that account. A better *Hero* would have been of great advantage to the serious half of the play; but, as it was, the sorrows of the innocent lady were presented with sufficient truthfulness to bar positive objection. It is in the humorous loves of *Beatrice* and *Benedick*, indeed, that the interest of this exquisite play has always lain, and in the glorious fooling of *Dogberry* and his inane crony *Verges*—the transparency of *Don John's* villanous plot, and its early discovery through the drunken babbling of *Borachio*, making small demands upon the attention of the audience. Messrs. Fitzjames and R. Cathcart played the two constables with a great deal of humour and appreciation of the lavish fun with which their speeches are overflowing. The funniest modern burlesque, every line of which is studded with jokes on subjects within the knowledge of nineteen-twentieths of the audience, would not call forth readier or more sustained laughter than the Dundrearyisms of *Dogberry* and goodman *Verges*. Miss Atkinson's *Beatrice*, though a little over-vehement in action, was a very pleasing performance, and the bitter banter flowed from her tongue with something very like a true relish. Her acting impressed us with the idea that, with longer study, it may become very charming indeed. Mr. Montgomery's *Benedick* is not a highly elaborated picture, but rather a vigorous drawing, the merits of which are greatly in the vigour of the handling. All his scenes with *Beatrice* were worked out with an evident mastery of the poet's bold but most subtle humour. In the scene where he is put upon by *Don Pedro*, *Claudio*, and old *Leonato*, with the view of bringing him and *Beatrice* together, his voice lacked the lightness and tenderness requisite to mark the full change in his feelings—or in his resolution; but still it was very effectively rendered; and his gallant determination not to be turned from his purpose of saving the heart-stricken *Beatrice* from death through unrequited love was a bit of capital high comedy. As we have before intimated, the applause given to his performance was warm and genuine; we are glad to say that we think it was well deserved.

The first performance of "An Awful Rise of Spirits" at the Olympic, on Monday evening, called forth more marked expressions of disapproval than we have heard in any of our theatres for a long time past, the old custom of "damning" pieces outright having gone into complete disuse. There is a report current that this so-called *jeu d'esprit*, which bears the name of Tom Taylor as its author, has but received a slight trimming—it could hardly have been polishing—at the hands of that admirable dramatist. If this is the true state of the case, we cannot but regret that any circumstances should have induced him to lend his name to so offensive a production. In point of subject it is *à propos* enough, but in the handling the piece fulfils none of the objects of its kind; and it is not only the reverse of funny, but ill-natured and full of inconsistency. Surely it is not in good taste that the "Ticket-of-Leave Man," founded upon a French piece, though made thoroughly English by adaptation, and a "sensation" drama *pur et simple*, should be followed by an acted tirade against "sensation dramas." In the piece under notice, Shakespeare is made to deliver himself of dull platitudes against the acting of his plays by foreigners, Monsieur Fechter and Mademoiselle Stella Colas, of course, being more directly referred to. The question with us is this: If Shakespeare had seen his *Othello* acted by three different English actors as we have seen it acted—or we may more truly say travestied—during the last month, would he have preferred the performances of these bunglers to such a performance even as that of Monsieur Fechter, faulty as it is? Our own opinion is that he would have accepted the latter as incomparably the better performance. The audience of Monday evening were manifestly of this way of thinking, for they hissed lustily nearly all that the ghost of Shakespeare was made to say. On the second performance some modification of the offensive speeches was attempted. From first to last this strangely objectionable little piece seems to have been produced by way of demonstration; and, to give it weight, almost the entire company of the Olympic was pressed into the cast, no doubt to the grievous mortification of the majority of those so gibbeted, especially of Mr. H. Neville, who represented the unfortunate *Shade of Shakespeare*. The piece is written in doggerel rhyme; and no line of it will strike the hearer as characteristic of Mr. Tom Taylor's strong, yet graceful pen. We shall be surprised to find that "An Awful Rise of Spirits" maintains even a forced place in the bills of the Olympic.

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